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ABSTRACT

This document proposes an information system for the food sector that integrates measures of prices, quantities, and values. It suggests that such an integrated information system provides more information about many developments in the food sector than a system that separately measures prices, quantities, or values. Concepts and approaches related to measuring food expenditures are discussed. Various analytical methods for measurement are then compared. They include value at retail store prices, commodity-flow method, measures of price, measures of quantity, and expenditures by food groups. The final section describes several analyses that can be conducted by using the measures discussed. These analyses are presented: sources of food, manufactured and fresh food, food purchasers, income and expenditures, outlets, productivity in food marketing, and marketing services. In addition to the 11 figures and 23 data tables within the text, 18 tables are appended. References and an explanation of the methodology are also appended. (YLB)

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Developing an Integrated Information System for the Food Sector

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DEVELOPING AN INTEGRATED INFORMATION SYSTEM FOR THE FOOD SECTOR. By Alden Manchester, Commodity Economics Division, Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 575.

ABSTRACT

An information system for the food sector which integrates measures of prices, quantities, and values provides more information about many developments in the food sector than a system that separately measures prices, quantities, or values. The author has developed such an integrated information system. His system allows greater understanding of the sources of food, outlets, food purchasers, and productivity in food marketing.

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SUMMARY

An information system for the food sector which integrates measures of prices, quantities, and values provides more information about many developments in the food sector than a system that separately measures prices, quantities, or values. The author has developed such an integrated information system. His system allows greater understanding of the sources of food, outlets, food purchasers, and productivity in food marketing.

The concept of an information system which integrates price, quantity, and value is hardly novel. But in the area of food prices, consumption, and expenditures, such a system has not been available. This study contributes to such a data and analytical system. Better data at many points would clearly provide improved measures. But, some highly useful analyses are possible with available data.

The origin of food can be explained and expenditures divided between sales from farms, home production, imports, and U.S. fisheries. Total food expenditures can be divided into manufactured products and fresh foods. The question of who pays for the food can be answered, with the portions financed by governments, businesses, consumers, and others indicated. Thus, we can make more refined comparisons of income and expenditures than have been possible.

The data set permits better measures of who gets what for all food, indicating how much goes to farmers and fishermen and to the marketing system. The outlets for both offpremise and away-from-home food are a basic part of the information system and can be measured both in dollars and in quantities.

Alternative measures of both food quantities and prices become available with this information system. These measures permit the integration of price, quantity, and value in a consistent fashion and provide measures of expenditures by food groups which are consistent with the totals both of prices and quantities.

Here are some of the principal findings of the author's analysis:

- Food expenditures by families and individuals were 14.5 percent of disposable personal income in 1985, down from 28.3 percent in 1921 and 60.6 percent in 1869.

- Food produced and consumed at home was 3 percent of all food consumed in 1985, compared with about 33 percent in 1869.

- Food stores, including supermarkets, sell 91 percent of food for home consumption; supermarkets alone sell 61 percent of all food for home consumption.

- Restaurants account for 40 percent of sales of food for away-from-home consumption, while fast food places account for 30 percent, schools and colleges 10 percent, and hotels and motels 5 percent.

- Labor productivity in food marketing increased from 1960 to 1972, declined between 1972 and 1980, and then rose slightly in 1981-82.

Developing an Integrated Information System for the Food Sector

Alden Manchester*

INTRODUCTION

A complete data and information system for the farm sector and its major subsectors has existed for many years. It has been updated and improved many times in the past half century. The data and information system for the food sector beyond the farm has received somewhat less attention.

A data system consists of the numbers and other factual data describing the sector or subsector of the economy that is of interest. An information system further embodies the analytical tools that are employed in making use of the data in decisionmaking. Furthermore, data are of at least two types; numbers and other facts are either simple or complex. Simple numbers are those that can be directly observed and reported, such as acres in corn and bushels produced. A complex number is an economic abstraction which is the result of a more elaborate analytical framework embodying a conceptual framework and informed judgment as to the appropriate coefficients. The estimation of farm income is perhaps the best example of how complex such a number really is. In principle, many such phenomena could be observed directly (for example, the incomes of farmers), but that would not make complex numbers into simple numbers; it would merely push the complexity back into each farmer's accounting system where it would become a "black box" whose workings are inscrutable to the observer.

A fundamental identity is that

price x quantity = value.

Quantity measures for most foods were developed years ago for use in situation and outlook analysis. The basic tool is the supply-and-use table which employs data on production, stocks, foreign trade, and nonfood use to derive estimates of domestic disappearance for food use. Until the eighties, such data were available for 250 foods, including all significant items (Manchester and Farrell, 1981).

Price data, mainly from the Bureau of Labor Statistics (BLS), U.S. Department of Labor, for a sample of foods bought by consumers have been available longer than quantity data. The price data, however, are of a specific type consistent with their intended use in constructing indexes of pure price

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change. Thus, one cannot insert these prices in the above identity and derive an estimate of the value of all of the beef purchased by U.S. consumers, for example. Measures of average prices are needed.

The value figure is expenditures for food in the United States. We can derive that figure independently of prices and quantities by several methods. The challenge is to develop a system which integrates prices, quantities, and expenditures. This report describes such an integrated system and several analytical uses.

Figure 1 provides an overview of the U.S. food system. Americans spent $347 billion for food in 1982 and another $55 billion for alcoholic beverages. Most of this $402 billion was paid for by families and individuals, but a portion was produced and consumed at home with relatively little cash outlay. Governments and businesses paid for part of the food. In these circumstances, we must determine what portion of food expenditures is incurred by each of these groups in order to make a meaningful comparison of food expenditures and incomes.

The share of food dollars going for away-from-home meals and snacks has been increasing for more than a century, but because restaurant meals include many more services than food purchased at the grocery store, the shares of value and quantity of food away from home are quite different.

Supermarkets now make 61 percent of the sales for home use, compared with 6 percent in 1939. Fast food places account for 30 percent of all away-from-home food sales, up from 7 percent in 1939.

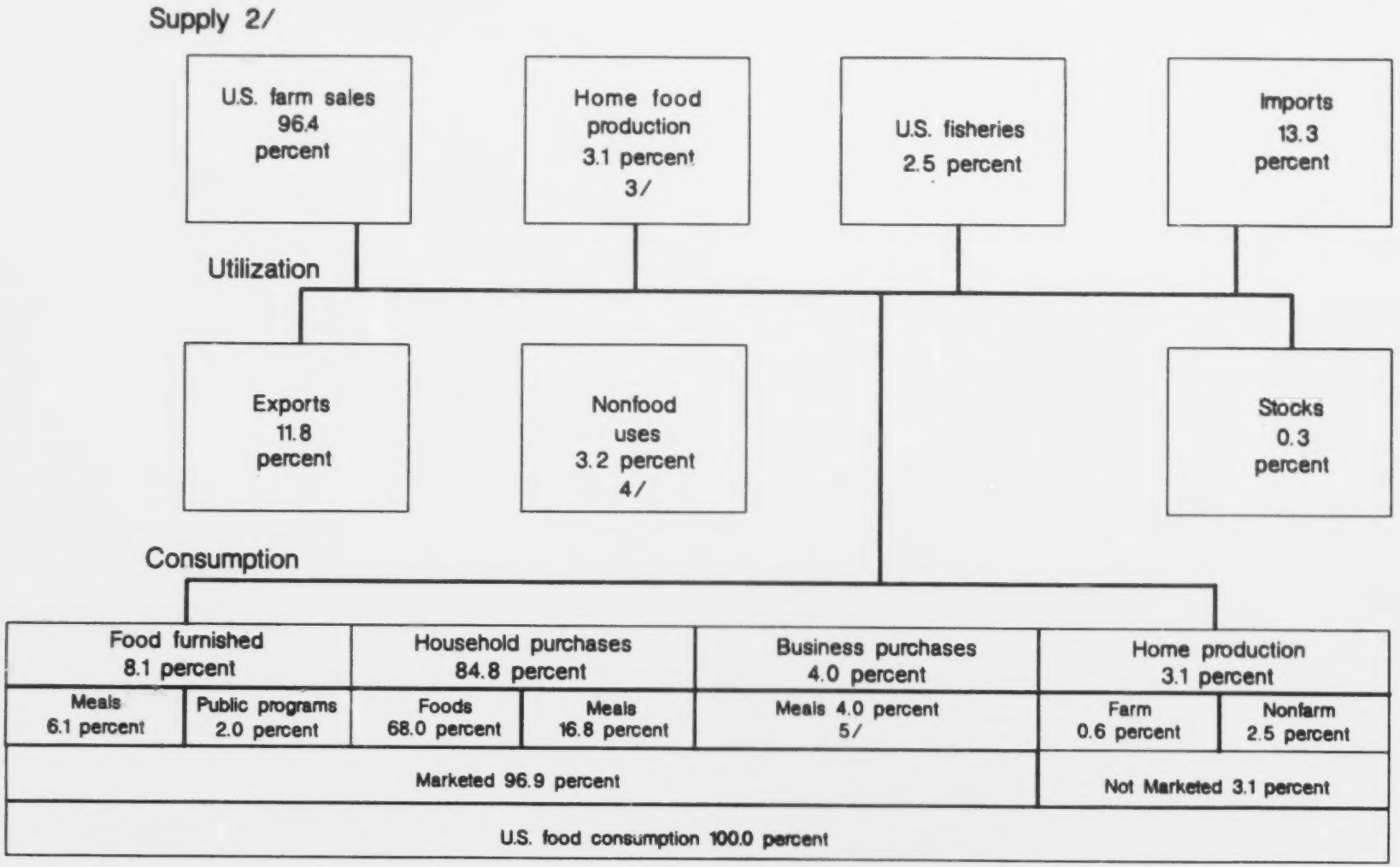
As farming has moved more and more into the industrialized economy, the contribution of farming to the value of food consumed has become smaller. The shares of farm input suppliers, processors, wholesalers, and retailers have increased. The share of restaurants and other away-from-home eating places, in particular, has risen sharply.

These and many other questions can be investigated using data on food expenditures. Several methods of measuring food expenditures are discussed in this report. In an ideal world where accurate data would be available on all economic activities, measuring food expenditures by each of the methods would yield identical results. In the imperfect real world, the degree to which measurements by each of the methods agree gives some indication of the confidence one can have in the results. In addition, each of the methods provides information on different aspects of the system.

There is no single right or best measure for all purposes. One measure is often more appropriate than another for a specific use. If complete, ideal data were available and if calculation was costless, the analyst should generate a new measure for each problem. But data are neither complete nor ideal and computation is not costless. This report presents a variety of measures wherever possible in order to broaden the analyst's range of choices. The information provided by each method is then used to describe certain aspects of the food production and marketing system. (See Manchester and King, 1979, for the early development of this food expenditure series.)

Figure 1

Food sector flows, 1982[1]



1/ Percentage of U.S. food consumption. 2/ Total supply is 115.3 percent of domestic consumption.
3/ Includes sport fish and game and farm and nonfarm home production. 4/ Excludes use for feed and seed.
5/ Business expenses for travel accounts and entertainment.

MEASUREMENT: CONCEPTS AND APPROACHES

There are three basic methods of measuring food expenditures and some variations:

- o Retail sales,
- o Commodity flow or value added, and
- o Value of quantities at retail prices.

For many purposes, measuring sales is the preferred method. The aggregate that one wishes to measure is the total purchases of food for offpremise use, meals and snacks, and alcoholic beverages by families, individuals, and institutions. To the extent that data are available, sales provide the most direct measurement of food expenditures.

The commodity-flow or value-added method builds up from the value of food products produced by farmers, imported, or caught by fishermen, adding the margins of each successive stage. These stages include processing, wholesaling, retailing, and food service. This method provides values by commodity groups which are not available by the sales method.

Value at retail selling prices starts from the identity mentioned earlier: price x quantity = value. Quantities of individual foods are valued at average retail selling prices and the total value determined. Because the only available prices for individual commodities are for retail stores, the additional margin for food service must be determined separately and added.

Constraints of Data Availability

Some data needed for each of these measurement methods are unavailable. Thus, the methods that one can use for any particular year are determined by data availability. Data tend to become increasingly available over time, although the increasing cost of obtaining statistical information and declining budgets exert a somewhat contrary influence.

Retail Sales

Data on retail sales by type of store are the product of the Bureau of the Census, U.S. Department of Commerce. They first became available from the 1929 Census. Since then, censuses have been taken in 1933, 1935, 1937, 1939, 1948, 1954, 1958, 1963, 1967, 1972, 1977, and 1982. Since 1951, the monthly and annual retail trade reports have provided current estimates by type of store from a sample of retail stores. The Bureau of Economic Analysis (BEA), U.S. Department of Commerce, has estimated annual sales from 1929 to 1950 and smoothed out some of the rough spots in the series since then. From 1965 through 1981, monthly selected service receipts provided data for hotels, motels, tourist courts, motion picture theaters, and bowling alleys. The monthly data have now been replaced by an annual survey with broadened coverage.

Information on how much food, alcoholic beverages, and meals and snacks are sold by different types of stores is generally available only from the censuses roughly every 5 years. Data for other years must be interpolated. The exception is grocery stores, for which an annual series is available from Supermarket Business magazine. The census figure for food sales by grocery stores is unusable because it did not change significantly for 25 years, while

the supermarket revolution transformed the sales of supermarkets and grocery stores. Until the advent of the electronic cash register, food store operators had no way of determining how much of their sales of groceries consisted of food products and how much was soap, detergents, paper towels, and other nonfood grocery products. Under these circumstances, grocery store operators have provided the Bureau of the Census with their best guesses, which did not change for many years. In fact, we get the anomalous situation that nonfood sales declined to accommodate an increase in sales of beer and wine during 1963-77. The Supermarket Business figures, on the other hand, are based on records from a limited number of stores on the sales of several hundred categories of foods and nonfoods. These reports have had the advantage of providing annual data on a consistent basis since 1947. One would prefer a larger sample as a base, but no such series is available (table 1).

Data from current retail trade and services reports of the Bureau of the Census provided the basis for 92 percent of expenditures for offpremise food and 73 percent of meals and snacks in 1980.

Quantities

The basic quantity information on food comes from supply-utilization data of the Economic Research Service. For basic commodities, this information is available since 1910. Annual data are available for all products and quarterly data for animal products and some crops. (For a more detailed discussion of these data, including a list of products, see Manchester and Farrell, 1981.)

The supply-use tables are mostly for farm-level products, although many are for consumer products, such as canned and frozen fruits and vegetables, individual manufactured dairy products, and others. Those for products such as flour and refined sugar include both final use and use in manufacturing other food products.

Table 1--Distribution of grocery store sales

Year	Food		Alcoholic beverages		Other nonfood	
	Census of Retail Trade	Supermarket Business	Census of Retail Trade	Supermarket Business	Census of Retail Trade	Supermarket Business
	Percent					
1963	84.5	76.5	1.5	4.9	14.0	18.6
1967	85.0	73.4	1.7	4.9	13.3	21.7
1972	84.9	73.1	2.1	5.4	13.0	21.5
1977	84.9	72.6	2.5	5.1	12.6	22.3
1982	78.2	71.7	3.3	5.5	18.5	22.8

Information on quantity and value of manufactured food products is available from the Census of Manufactures every 5 years for nearly all foods. Some, such as soup, are concealed in larger aggregates in order to preclude disclosure of the operations of dominant manufacturers. Information on production of manufactured dairy products is available from the National Agricultural Statistics Service (NASS), U.S. Department of Agriculture (USDA). Current quantity information on flour and fats and oils is provided monthly by the Bureau of the Census. NASS also provides data on utilization of potatoes, peanuts, and most fruits and vegetables. Data on purchases of individual foods by food service firms is supplied only in two surveys (Van Dress, 1971 and 1982).

The annual survey of manufactures by the Bureau of the Census provides value data on shipments of classes of food products. The Census of Manufactures is used as a base every 5 years, and annual figures are obtained from a sample of manufacturers. No effort has been made to revise the series when a new Census of Manufactures is taken, and the change from a noncensus year to a census year, from 1971 to 1972 for example, is sometimes unbelievable.

Retail Prices

The principal source of data on retail price movements is the Bureau of Labor Statistics (BLS). Since 1890, BLS has published retail price indexes plus some retail price information. Beginning in 1978, coverage was expanded to the entire urban portion of the country. Before then, only prices paid by clerical and manual workers in cities were represented. Through 1977, BLS collected prices for a sample of individual food products that were fairly narrowly defined with detailed specifications for each product. Since that time, the indexes reflect a broader coverage of food products, but the component price in each store is still for a narrowly specified product.

NASS and predecessor agencies collected prices paid by farmers for individual food products from 1910 to 1976. These prices were for products usually purchased by farmers in a particular store, not for the narrowly defined products priced by BLS.

From BLS and formerly from NASS, good information is available on price movements in the form of indexes. The information on price levels from these sources is much less satisfactory because it is not designed to provide such data. One must turn to other sources to determine the average level of prices for all purchases. The primary source of such data is the periodic surveys of food consumption and purchases conducted by USDA since the mid-1930's. From the quantity and value data provided for individual products in these surveys, imputed average prices have been calculated. David Smallwood has calculated such average prices for purchased foods in the 1977-78 Nationwide Food Consumption Survey. Corinne LeBovit had earlier calculated similar prices from the spring portion of the 1965-66 Household Food Consumption Survey.

Farm Prices

NASS has collected and published prices received by farmers for most food products for many years. Such prices are available for most products since 1910 and for major crops well into the 19th century. These are average prices for all of a given product, so that the prices of cattle, for instance, include both cattle going to slaughter and those going to the feedlot. Sorting out the food portion necessitates the use of other data, in this case prices from market news.

Manufacturers' Prices

Implicit average selling or transfer prices of manufacturers of food products for individual products and product groups can be calculated from the Census of Manufactures data on quantity and value.

Valuation Problems

An analyst can measure the value of foods at the manufacturer, farm, and retail levels for most foods, using the quantity and price data available. But for at least three categories, this measurement is not straightforward.

Most food consumed in the United States was once produced at home. Although much less important than a century ago, measuring home production is still a problem. What is the appropriate level at which to value home-produced food? In estimating farm income, the appropriate level is the price at which a food could have been sold if the farmer had chosen to sell it rather than to eat it at home. Primarily for comparison with other sources of food, however, the value of food produced and consumed on farms and in nonfarm households (mainly home gardens) is estimated here at retail prices in the stores in the immediate area, as is done in the Nationwide Food Consumption Survey.

A different kind of problem arises where the sale is of a product combining food and other goods and services. In hospitals, nursing homes, boarding houses, and other institutions, food is not priced separately. Only a relatively small portion of the hospital room rate is for food, but there is no way of determining what it is. The choice then is between valuing such food at the cost to the hospital or other institution or at estimated restaurant prices. The food expenditure series values it at cost, because that is the last point at which a separate transaction for food is observed.

Somewhat similar problems are encountered in the case of food furnished as pay to employees in restaurants and institutions or supplied to inmates in prisons. Again, the choice has been made to value these at cost to the institution in the basic series.

What Has Been Measured

Data are available to estimate food expenditures on the basis of retail sales since 1929. Expenditures for food since 1869 can be estimated by the commodity-flow method for census years with interpolations for the intervening years. The basic food expenditure series was calculated by use of retail sales beginning in 1929. From 1869 to 1929, the commodity-flow method was used. There were some differences in the 1929 estimates, and the figures resulting from the commodity-flow procedure for the earlier years were modified so the totals were equal in 1929. Figures are available for 1869, 1879, and annually since 1889. The annual interpolations between census years were based on data developed by Barger (1955) and Shaw (1947).

Value of foods at retail store prices has been estimated for selected years since 1940. The data for such a calculation are available for all years since 1935. If the problem of determining average price levels could be satisfactorily resolved for earlier years, these calculations could be extended back to 1910. We can annually estimate the additional margins of food service establishments since 1953, when the Bureau of Labor Statistics

began collecting and publishing prices for food away from home. Before that date, only the data from the Census of Business were available.

MEASUREMENT: COMPARISONS

The basic series shows food expenditures rising from $3.6 billion in 1869 to $24 billion in 1929, $74 billion in 1960, and $411 billion in 1985 (table 2). Away-from-home meals and snacks rose from 5 percent of the total in 1869 to 43 percent in 1985. Home production declined from 33 percent of the total in 1869 to 2 percent in 1985.

Value at Retail Store Prices

Valuing all food at retail store prices provides a very useful analytical tool. Several uses to which it can be put, such as determining the origin of food supplies and measuring marketing services, are discussed in this report.

For such a measure, food which is valued at other levels in the basic expenditure series must be revalued to retail store price levels. This calculation involves some additions from lower price levels (such as manufacturers' sales to consumers) and a number of deductions for higher levels (such as restaurant sales). The base year for this measure is 1977. Using the commodity-flow method and data from the Censuses of Business and Manufactures for 1977, the following measures of prices at various levels were obtained:

	Percentage of retail store prices, 1977
Manufacturers' and shippers' selling prices	68.83
Buying prices of food service	78.61
Retail store prices	100.00
Restaurant prices	167.10

The base for measurement is the sales by manufacturers and shippers of fresh products (fresh fruits, vegetables, and shell eggs) at their selling prices (table 3). These prices are assumed to be the same both for sales to retail stores and to food service organizations. Although this assumption is probably not exactly true because of differences in package size and composition of products, the differences may well be nearly offsetting. Restaurants and institutions buy many products in larger containers than do households, but offsetting that, they buy others in individual serving packets at considerably higher prices.

The only required adjustments to expenditures for offpremise consumption are adjustments to sales by manufacturers and wholesalers to consumers and USDA donations of commodities to families. These transactions are revalued to the retail store price level by adding 27.2 percent in 1977 (100.00/78.61 = 1.272) and a comparable amount in other years, the exact amount depending on the relative movement of the price indexes.

Table 2--Expenditures for food and alcoholic beverages

Year	Food for offpremise use			Meals and snacks			All food	Alcoholic beverages
	Sales	Home produced, donated	Total	Sales	Supplied, donated	Total		
	Million dollars							
1869	2,245	1,194	3,439	--	--	192	3,631	307
1879	2,735	1,063	3,798	--	--	288	4,086	411
1889	2,743	1,405	4,148	--	--	307	4,455	742
1899	3,649	1,350	4,999	--	--	516	5,515	1,008
1909	6,277	2,217	8,494	--	--	1,004	9,498	1,603
1919	14,639	4,706	19,345	--	--	2,830	22,175	1,540
1929	15,319	4,558	19,877	3,496	625	4,121	23,998	1,540
1940	12,385	3,499	15,884	3,212	683	3,906	19,790	2,588
1950	33,231	5,797	39,028	10,071	2,398	12,469	51,497	8,672
1960	49,424	4,697	54,121	16,248	3,359	19,607	73,728	12,932
1970	73,441	4,086	77,527	33,762	5,721	39,483	117,010	22,003
1977	130,524	6,035	136,559	73,259	11,745	85,004	221,563	36,633
1980	177,654	8,275	185,929	103,980	16,660	120,640	306,559	50,052
1982	196,772	9,435	206,207	122,538	18,633	141,161	347,368	55,476
1985	225,317	7,927	233,244	155,922	21,373	177,295	410,539	65,930

-- Not available.

Note: See app. table 1 for annual data since 1889.

Table 3--Sales and margins for consumer food by commodity-flow method, 1977

Type of seller	Total sales 1/	Sales at manufacturers' prices 2/	Wholesale margin 3/	Sales at wholesale prices	Retail margin 4/	Retail sales	Sales taxes and tips	Total
				Million dollars				
Sales through retail stores:								
Manufacturer	118,277	--	--	--	--	--	--	--
Shipper	13,327	--	--	--	--	--	--	--
Transportation	1,682	--	--	--	--	--	--	--
Total	133,286	21,129	0	21,129	--		--	--
Merchant wholesalers and assemblers	88,584	47,983	--	--	--	--	--	--
Agents and brokers	26,444	7,953	--	--	--	--		--
Sales branches and offices	36,562	17,380	--	--	--	--		--
All wholesalers	151,337	73,316	10,691	84,007	--	--		--
Food chain warehouses	28,974	5/ 28,974	1,753	30,727	--	--	--	--
Total	--	123,419	12,444	135,863	40,464	176,327	2,539	178,865

See footnotes at end of table.

Continued--

Table 3--Sales and margins for consumer food by commodity-flow method, 1977--Continued

Type of seller	Total sales 1/	Sales at manufacturers' prices 2/	Wholesale margin 3/	Sales at wholesale prices	Retail margin 4/	Retail sales	Sales taxes and tips	Total
			Million dollars					
Sales through food service establishments:								
Manufacturers and shippers		8,480	0	8,480	--	--	--	--
Merchant wholesalers and assemblers		16,210	2,433	18,613	--	--	--	--
Agents and brokers		2,999	800	3,799	--	--	--	--
Sales branches and offices		4,642	561	5,203	--	--	--	--
All wholesalers		23,851	3,794	27,645	--	--	--	--
Retail stores		649	6/ 267	916	--	--	--	--
Total		32,980	4,061	37,041	41,770	78,811	6,655	85,466

-- = Not calculated until a later point.

1/ Food and kindred products, excluding pet food, animal feed, alcoholic beverages, ice, food and feed materials, and byproducts.

2/ Sales at manufacturers' or shippers' prices plus transportation. Distribution of sales from Census, Sales by Class of Customer.

3/ Basic data from 1977 Census of Wholesale Trade, vol. 1, part 3. Includes margins of more than one wholesaler in some cases.

4/ Basic data from annual retail trade report, Bur. of the Census. Markup in institutions assumed same as eating places.

5/ Includes wholesalers' and warehouse margins.

6/ Includes wholesalers', warehouse, and store margins.

All expenditures for meals and snacks must be adjusted. The additional sales taxes, due to higher average rates on restaurant meals than on store sales of food, are subtracted. Tips are also subtracted. Net sales are then total sales, plus the value of child-nutrition subsidies, less tips, less additional sales taxes. Net sales were reduced by 40.2 percent in 1977, 37.0 percent in 1967, and comparable amounts in other years, depending on the movement of the price indexes. Food supplied by institutions and employers is valued in the basic series at its purchase price, so 27.2 percent is added in 1977 and 27.0 percent in 1967 to estimate the value of food supplied at retail store prices.

Prices at the four levels do not move in exactly the same way. Year-to-year changes are different and there are long-term trends in margins (fig. 2). (The margins are indicated by these calculated indexes of prices at four levels as a percentage of retail store prices.) The accumulated margins between the manufacturer and shipper level and retail stores have varied, but no long-term trend is evident. On the other hand, restaurant margins have risen fairly consistently since 1929.

Results of these calculations for selected years since 1929 are shown in table 4. The figures for offpremise use are only a little different from those in the basic series because the adjustments apply to a small component, but the figure for meals and snacks rises more slowly because the effects of the increasing margin shown in figure 1 are eliminated.

The other method of estimating the value at retail store prices starts with the quantity of food in retail weight multiplied by retail prices to derive a value. (See Heien, 1983, for use of a similar measure.) Most of the food products for which ERS regularly prepares supply-utilization tables are for products fairly near the farm level. Many are for first-generation manufactured products, such as flour, canned milk, refined sugar, margarine, shortening, and frozen vegetables. None of the ERS tables are for second-generation products, the comminuted products that combine a number of

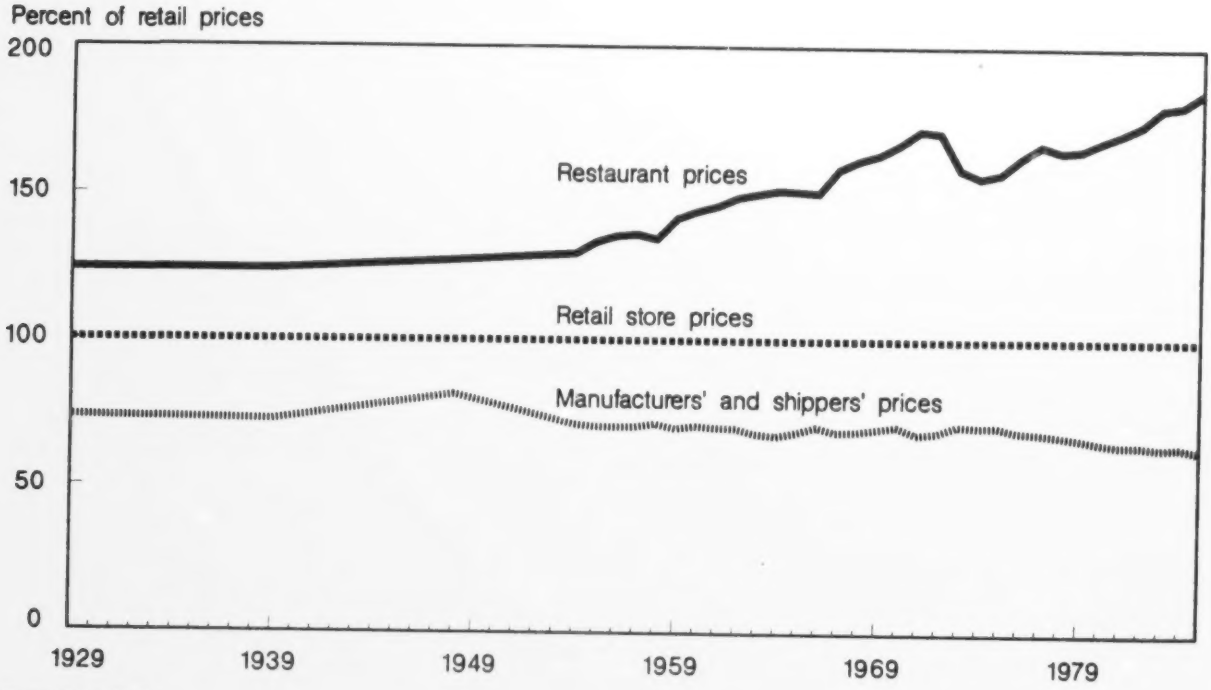
Table 4--Food expenditures at retail store prices from sales and markups

Year	Food for offpremise use			Meals and snacks	All food
	Sales and donations	Home production	Total		
	Million dollars				
1929	15,469	4,558	20,027	3,500	23,527
1939	12,011	3,270	15,281	3,113	18,394
1948	31,942	6,706	38,648	10,067	48,715
1954	40,314	5,642	45,956	12,977	58,933
1960	49,763	4,597	54,360	14,795	69,155
1970	74,049	3,811	77,860	25,881	103,741
1977	131,203	6,002	137,205	53,289	190,494
1980	178,363	8,195	186,558	75,071	261,629
1985	227,608	6,860	234,468	101,610	336,078

Note: See app. table 6 for annual data.

Figure 2

Relative prices of food at three stages of the system



Source: App. table 5.

ingredients. 1/ A substantial part of the value of some agricultural products is involved in these comminuted foods, about a third of total value. Most of the value for grains, sweeteners, and fats and oils comes from comminuted products.

For each commodity or commodity group for which ERS maintains supply-utilization data, total disappearance for domestic sales (omitting products produced and consumed on the same farm) is divided among the main products and each of the comminuted product groups. The basic data come from the tables of the Census of Manufactures for 1967, 1977, and 1982 on materials used. The total value at retail store prices is allocated to the materials shown, so some minor ingredients are ignored.

The simplest product group is fish, for which the Census of Manufactures shows no use in other products. Thus, we assumed that all fish products are sold as seafood and are priced accordingly.

1/ Comminuted products are those combining several ingredients where no original product is dominant; for example, baked goods, confectionery products, soups, and frozen dinners.

The most complicated product group is sweeteners. Their use is reported by 13 other industries. The retail store value of each of these other product groups is allocated among sweeteners and the other products used in their manufacture in proportion to the relative value of the sweeteners used in each of the other product groups. For example, 17.1 percent of the value of food materials used in bakery products consisted of sweeteners in 1977, so 17.1 percent of the 18.8 billion dollars' worth of bakery products (at retail store prices) is allocated to sweeteners. In total, 5.8 billion dollars' worth of sugar and other sweeteners was sold through retail stores or food service, and another 22 billion dollars' worth of sweeteners was used in other products (table 5).

Sales through retail stores and food service are valued at 1977 average prices, which come from the 1977-78 Nationwide Food Consumption Survey (USDA, HNIC) adjusted to calendar year 1977 by use of BLS price indexes. The total value of each of the comminuted products is derived from quantity shipments in the Census of Manufactures and similar 1977 average prices.

Table 5--Value at retail store prices of food marketed, 1977

Farm-product group	Value at retail store prices		
	Original product 1/	In comminuted products 2/	Total sales 3/
	Million dollars		
Meat	41,709	2,378	44,087
Fish	4,508	0	4,508
Poultry and eggs	11,756	3,596	15,352
Milk	22,435	1,412	23,847
Fruits, vegetables, and nuts	28,132	9,185	37,317
Grains	1,535	13,771	15,306
Sweeteners	5,783	22,016	27,799
Fats and oils	3,167	8,743	11,910
Other 4/	6,278	6,545	12,823
Total	125,303	67,646	192,949

1/ All uses where the original product is still identifiable; includes fresh, canned, frozen, and dried.
2/ Comminuted products are those combining several ingredients where no original product is dominant; for example, baked goods, confectioneries, soups, and frozen dinners.
3/ Omitting home production and sales taxes.
4/ Herbs, spices, cocoa, popcorn, mint, chicle, yeast, oils and flavors, coffee, and tea.

The total value at retail store prices (including home consumption) in 1977 was $201,521 million (table 6). This compares with $190,494 million calculated from food expenditures (table 4), a 5.8-percent difference.

Over half of the difference is traceable. Several factors whose effects are not considered in the annual estimates affect the totals:

Value at retail store prices (from prices and quantities), 1977

		Million dollars
Total, unadjusted (table 6)		201,521
Less:	Exports and shipments to territories of comminuted products	-1,008
	Change in wholesalers' and retailers' stocks	- 849
	Shrinkage	-4,812
Plus:	Higher prices in Alaska and Hawaii	+ 263
Total, adjusted		195,079

The adjusted total is 2.4 percent greater than the $190,494 million estimated from sales and markups. Most of the difference is due to shrinkage in the marketing channels not otherwise accounted for and to exports and shipments to Puerto Rico, Guam, and Samoa of comminuted products whose value was included in the calculations because these products are not included in the supply-utilization tables. This shrinkage is estimated at 2.4 percent (Pierson and others, 1982). Changes in stocks of wholesalers and retailers more than

Table 6--Two measures of value of food at retail store prices, including home-produced foods

Year	From sales and markups	From prices and quantities	Difference
	- - - Million dollars - - -		Percent
1960	69,155	74,157	7.2
1965	76,668	84,415	10.1
1970	103,741	111,927	7.9
1975	166,358	181,065	8.8
1977	190,494	201,521	5.8
1980	261,629	278,411	6.4
1983	307,669	324,240	5.4

Note: See app. table 6 for annual data.

offset the effects of higher retail store prices in Alaska and Hawaii than elsewhere in the country. The basic Nationwide Food Consumption Survey that provided the average prices did not include Alaska and Hawaii (USDA, HNIC). The difference shown here is based on supplementary surveys in Alaska and Hawaii. Over the years, the two measures have not moved exactly together; the difference has been as great as 10 percent (table 6).

Commodity-Flow Method

BEA's input-output analysis is an application of the commodity-flow method. The flows of commodities through the system are followed from farm to manufacturer and then through transportation, wholesaling, retailing, and food service, with appropriate margins added at each level. The input-output analysis provides the base-year data for the National Income and Product Accounts. BEA conducts this analysis for each year of the Economic Censuses (USDC, BEA).

The food category in input-output analyses (and also in personal consumption expenditures) must be adjusted by removing those items which are not human food to obtain a measure comparable to that in this food expenditure series. This adjustment involves separating pet food, animal feed (primarily for horses), and ice (appendix table 18).

Food expenditures as estimated by the commodity-flow method in the input-output analysis were significantly higher than those estimated primarily from retail sales in 1963, 1967, 1972, and 1977 (table 7). The big differences are in food purchased for offpremise consumption. The input-output results are 14 percent higher in 1963, 21 percent higher in 1967, 18 percent higher in 1972, and 19 percent higher in 1977.

Those differences are not from the estimated margins in wholesaling and retailing. In 1977, these margins added 45.5 percent to the value of foods at the prices of manufacturers and shippers (plus transportation) in the input-output analysis. Comparable margins for the expenditure series were 44.9 percent. The lower margins of the food expenditure series would reduce total expenditures by 0.4 percent.

These large differences apparently are not caused by assigning a substantially larger share of food products produced by manufacturers or sold by shippers to consumer foods rather than to intermediate products to be used by other manufacturers. The value of intermediate uses of the products of the food and kindred products industry other than in eating and drinking places was $50,401 million in the 1977 input-output analysis and $49,283 million from the Census of Manufactures (table 15). Imports of intermediate products totaled at least $1 billion. Because the tables of the Census of Manufactures on materials used provide nearly all of the information on sales of intermediate food products to other manufacturers, their completeness becomes a major consideration. Manufacturers are asked to report only the quantity and value of major products used. All products which are minor to that industry are reported simply as other materials and supplies. The rules of thumb by which the all-other amounts are distributed thus become important, but they do not appear to cause the differences.

In the numerous checks and balances built into a commodity-flow estimating procedure, a figure derived from retail sales is logically employed. If one uses the Census of Retail Trade merchandise line sales for grocery stores,

Table 7--Comparisons of expenditures for food and alcoholic beverages

Item	1963		1967		1972		1977	
	Food expenditures 1/	Input-output analysis 2/	Food expenditures 1/	Input-output analysis 2/	Food expenditures 1/	Input-output analysis 2/	Food expenditures 1/	Input-output analysis 2/
	Million dollars							
Food purchased for offpremise consumption	51,495	58,958	59,544	71,942	82,555	97,625	130,742	155,705
Food produced and consumed on farms 3/	954	954	718	718	804	804	1,092	1,092
Purchased meals and snacks	16,399	18,508	22,254	25,089	35,037	38,817	68,095	76,175
Personal	--	14,903	--	19,930	--	29,979	--	59,459
Business	--	3,605	--	5,159	--	8,838	--	16,716
Food furnished to employees	1,350	1,350	1,944	1,944	2,010	2,010	3,807	3,749
Food used by others 4/	4,748	2,583	6,153	3,310	8,920	6,447	15,230	7,017
All meals and snacks	22,497	22,441	30,351	30,343	45,987	47,274	87,132	86,941
All food	74,946	82,353	90,613	103,003	129,346	145,703	218,966	243,738
Packaged alcoholic beverages	7,984	6,258	10,120	9,042	15,291	14,818	22,226	21,910
Alcoholic drinks	6,149	6,397	7,396	8,344	10,486	9,826	14,969	12,110
Personal	--	4,779	--	4,537	--	7,435	--	9,105
Business	--	1,579	--	3,724	--	2,192	--	5,559
Other	--	39	--	83	--	199	--	446
All alcoholic beverages	14,133	12,655	17,516	17,386	25,777	24,644	37,195	34,020
All food and beverages	89,079	95,008	108,129	120,389	155,123	170,347	256,161	277,758

-- = Not available.

1/ Excludes home production and USDA donations to families.

2/ At purchaser's prices, excluding pet food, animal feed, and ice. Food used by others estimated by ERS from producers' value.

3/ Excludes firewood. Valued at farm prices.

4/ Includes education, hospitals, institutions, recreational places, railroads, and airlines.

rather than the Supermarket Business figures (table 1), grocery store sales of food are substantially larger than in the food expenditure series, but that does not account for all of the difference.

	Difference in grocery store sales of food	Difference in offpremise sales
	Million dollars	
1963	4,204	7,463
1967	7,476	12,398
1972	10,949	15,070
1977	18,159	24,772

The difference in grocery store sales was 56 percent of the overall difference in 1963, increasing to 60 percent in 1967 and 73 percent in 1972 and 1977.

George Jaszi, BEA director for 23 years, recognizes the problem caused by using retail store sales as the mover for estimates of food expenditures in the early 1970's (Jaszi, 1986, p. 414). Estimated food expenditures rose with total sales of grocery stores, even though much of the increase was in nonfoods. However, the benchmark estimates from the input-output analysis are also affected by overstatement of food sales in grocery stores.

Measures of Price

Price indexes for food and its at-home and away-from-home components are available from BLS and from the National Income and Product Accounts of BEA. Two additional measures were prepared in this study.

The BLS indexes use fixed weights which are revised approximately every 10 years. The implicit deflator for personal consumption expenditures for food (the GNP deflator) is calculated by dividing current food expenditures by those at fixed retail store prices. The latter are calculated using BLS price indexes for major food groups and the ERS consumer expenditure figures from the marketing bill plus fish and imports as weights.

A link-and-chain price index was constructed by calculating a link index for each pair of years by use of the first year's quantities (disappearance for domestic consumption) as weights. These indexes of year-to-year change in price are then chained together with 1977 as the base year (table 8, line 6). This index includes both the effects of annually changing weights and the effects of change in average price for each product between 1967 and 1977. It also includes the effects of changes in the uses of products such as flour, sugar, and fats and oils between 1967 and 1977 and between 1977 and 1982. For food at home, the resulting link-and-chain price index rose somewhat more between 1960 and 1984 than the BLS index or the GNP deflator, 243 percent compared with 227 percent for the BLS index and 222 percent for the GNP deflator. Allowing for changes before 1967 would increase this disparity. Most of the difference between the BLS index and this link-and-chain index are probably due to changes in the mix of package sizes, qualities, and brands, and changes in use. In a comparison of 42 foods, Lamm (1980) constructed

fixed-weight (Laspeyres) and changing-weight (Paasche) indexes for 1964-77 and found them generally similar.

Using this link-and-chain price index, we adjusted expenditures at retail store prices (table 4) to 1977 price levels. Sales of meals and snacks at 1977 retail store prices were adjusted by adding the purchases of food for institutions, which are valued at less than restaurant prices, all at 1977 levels. This adjustment provided an estimate of total food expenditures at 1977 prices. I calculated the implicit deflator by dividing food expenditures at current prices by food expenditures at 1977 prices (table 8, line 3). These calculations indicate that the prices of all food rose 240 percent during 1960-84, compared with 244 percent by the BLS index and 239 percent by the GNP deflator.

Measures of Quantity

The interrelationships of price, quantity, and value that were discussed earlier lead to a variety of measures of food consumption. One can add up the pounds of beef, oranges, and flour at various levels in the marketing system. But this approach takes a pound of scallops at $7 equal to a pound of flour at 25 cents. The ERS index of per capita food consumption deals with these problems by using fixed price weights, changing the weights every 10 years. Other approaches use price indexes to deflate the value figures for food expenditures.

ERS measures consumption (disappearance) both in primary distribution weight and in retail weight. Primary distribution weight is usually the weight as manufactured for processed products and quantities produced for fresh

Table 8--Food prices by eight measures

Measure	1960	1965	1970	1975	1980	1984
			1977 = 100			
All food:						
BLS	45.8	49.1	59.8	91.3	132.5	157.6
GNP deflator	46.7	49.3	61.8	93.6	131.4	157.4
Food expenditures deflator	45.0	47.9	58.1	93.4	133.2	149.0
Food at home:						
BLS	47.1	50.2	59.8	92.4	132.2	153.8
GNP deflator	48.4	51.9	62.3	95.7	131.0	154.7
Link-and-chain	43.6	46.3	55.4	93.8	131.4	149.6
Food away-from-home:						
BLS	40.6	45.4	59.9	87.0	133.3	159.7
GNP deflator	41.1	45.9	60.5	87.7	132.4	165.2

Note: See app. table 7 for annual data.

products, but there are many variations. Retail weight is an estimate of the weight as sold in retail stores. For most processed products, it is the same as primary distribution weight. For meats, there are substantial changes in going from carcass weight (the primary distribution weight) to retail cuts.

There are varying amounts of inedible matter in different foods: bones in meat and poultry, pits in peaches, cores in apples, and shells on peanuts. Measuring edible weight eliminates the average amount of inedible materials from each category. The conversion factors are taken from Adams (1975).

But these adjustments do not solve all the problems. A number of products are reconstituted before they are used, such as potato flakes, dried milk, and evaporated milk. Coffee and tea present a special problem. Other beverages--milk, soft drinks, fruit juices--are measured as liquids. In the retail weight measure, coffee is beans and tea is leaves. When the water is added, they make many times more beverage. In order to provide comparable measures for beverages of different kinds, coffee and tea are here calculated in liquid form. Of course, when one does this, beverages play a much more important part in the totals.

The way in which different products are handled, especially beverages, greatly affects the results (table 9). Total consumption on an edible weight basis generally has increased since 1910. If only the solid foods are included, consumption declined. The meat figures are particularly sensitive to the stages of the beef and pork cycles in each of these years. Omitting soft drinks from the retail weight figures, as is usually done, shows a decline over these 70 years, but including soft drinks indicates increased per capita consumption. The price-weighted index behaves somewhat differently than the retail weight figures. That index assumes no change in the product mix made from each of the basic commodities, such as flour or fats and oils, for at least 10-year periods.

Another method of estimating change in quantity is by deflating food expenditures. The simplest method of deflating food expenditures is to use the BLS food price indexes. Because the difference between away-from-home and at-home food prices has already been allowed for in calculating expenditures at retail food store prices, a straightforward method is to deflate expenditures at retail food store prices by the BLS price index for food at home. Thus, quantity weights in the price index are fixed for approximately 10-year periods. A link-and-chain index was constructed to allow for yearly changes in quantities of individual foods or food groups and to reflect those changes as well as price changes in the index. Total food expenditures at retail store prices were deflated using this index. Comparisons of the eight indexes are shown in table 10.

The simplest measure--pounds of food, including soft drinks--increased 10 percent from 1960 to 1983. The price-weighted indexes give some evidence of the effects of the particular method of weighting which is selected. If one uses 1967-69 prices as weights, the index increases 13.6 percent from 1960 to 1983. If 1977 prices are used as weights, the increase is 13.9 percent. Changing weights each decade gives an increase of 11.1 percent. The pattern in intervening years is quite different. Use of price weights gives meat, poultry, and fish much more importance than they would have if pounds were used, and fresh fruits and vegetables and sweeteners are less important (table 11). The choice of the time period for the weights also makes quite a bit of difference (table 10).

Table 9--Various measures of per capita consumption of food

Year	Price-weighted index	Retail weight (civilian)		Edible weight (civilian and military)			
		Excluding soft drinks	Including soft drinks	Coffee, tea, soft drinks	Fluid milk products, fruit juices	All other foods	Total
	1967=100	Pounds					
1910	84.0	1,589	1,598	277	290	1,086	1,653
1920	83.4	1,542	1,563	317	306	1,059	1,682
1930	86.9	1,540	1,569	329	298	1,083	1,710
1940	91.7	1,548	1,596	409	313	1,081	1,803
1950	96.1	1,505	1,595	453	350	1,054	1,857
1960	97.2	1,400	1,509	433	335	1,045	1,813
1970	102.4	1,397	1,579	494	318	1,045	1,857
1980	103.8	1,407	1,668	536	306	1,039	1,881

Table 10--Food use per capita by eight measures

Measure	1960	1965	1970	1975	1980	1983	Change, 1960-83
	1977=100						Percent
Quantity indexes:							
Pounds of food	92.9	93.0	96.8	96.7	102.0	102.2	10.0
Price-weighted indexes using--							
1967-69 prices	90.7	91.9	97.1	97.3	100.4	103.0	13.6
1977 prices	90.9	96.6	101.7	97.7	101.1	103.5	13.9
Changed prices 1/	91.9	95.4	98.6	98.1	100.3	102.1	11.1
Previous year's prices (Link-and-chain index)	91.5	93.5	99.2	95.7	101.8	104.1	13.8
Expenditures deflated by:							
BLS all-food price index	87.4	89.7	96.4	94.7	101.5	102.7	17.5
BLS food-at-home price index	95.0	95.5	99.0	97.1	101.5	101.7	7.1
GNP deflator	88.3	89.4	93.5	93.8	102.4	103.4	17.1
Link-and-chain price index	91.5	94.1	99.2	93.7	100.7	104.7	14.4

Note: See app. table 8 for annual data.
1/ Through 1965, 1957-59 prices; 1966-1975, 1967-69 prices; thereafter, 1977-79 prices.

Deflating food expenditures by four different price series provides alternative measures of changes in food quantities (table 10). The simplistic deflation of total food expenditures by the BLS all-food price index yields a 17.5-percent increase in quantities between 1960 and 1983. This measure is inappropriate because the fixed-weight BLS price index reflects the changes in food at home and food away from home and among commodity groups only at approximately 10-year intervals.

Deflating expenditures at retail food store prices by the BLS food-at-home price index indicates only a 7.1-percent increase in quantities between 1960 and 1983. This measure provides a year-by-year adjustment for the change from food at home to food away from home but only the once-a-decade adjustment for product mix.

Use of the GNP implicit price deflator for food yields a 17.1-percent increase in quantities over the period. The GNP deflator is calculated by dividing current food expenditures by those at 1982 retail store prices. The 1982 prices are calculated from BLS price indexes for major food groups weighted by ERS consumer expenditures from the marketing bill.

Deflating food expenditures at retail store prices by a link-and-chain price index which uses the previous year's prices as weights provides a 14.4-percent increase in quantities of food over the period. This calculation, while more complicated than the others, comes closest to separating price and quantity changes into their components. Yearly changes in product mix are reflected in the quantity measures and quality changes in the average price for each commodity.

Expenditures by Food Groups

The two measures of value at retail store prices make possible the calculation of expenditures by food groups. The expenditures for each food group derived from price and quantity data are adjusted to the total value at retail store

Table 11--Relative importance of selected product groups in four quantity indexes, 1981

Product group	Pounds of food	Price-weighted indexes using--		
		1967-69 prices	1977 prices	Previous year's prices
	Percent			
Meat	9.6	24.4	22.4	23.5
Poultry	3.8	5.1	6.0	5.6
Fish	1.0	2.0	2.4	2.4
Fresh fruits and vegetables	18.7	9.5	8.2	8.1
Sweeteners	20.3	15.7	14.2	14.9

prices from prices and markups, using the same adjustment for each commodity group. The other adjustments which were made to obtain value at retail store prices from sales and markups are then reversed proportionately for each commodity group (table 12). These values are for all of the uses of each product group including both retail products and comminuted products. This calculation assumes that the distribution of each commodity group between offpremise use and food service is the same. More refined estimates can be made using survey data, but that has not been done for this study.

For the base years, 1967, 1977, and 1982, the farm product groups can be translated into consumer product groups (table 13). Between 1967 and 1982, the share of meat products in total consumer expenditures declined by 2.3 percentage points and fresh fruit and vegetables by 3.9 percentage points. Beverages had the largest gain. Expenditures reflect both price and quantity changes. In most of these cases, the biggest effect is from price change rather than quantity change. The prices of sugar, cocoa, and coffee were all high in 1977.

Table 12--Expenditures for purchased foods (excluding food produced at home), by farm-product group

Value in all products	1960	1965	1967	1970	1975	1977	1980	1984
				Million dollars				
Meat	16,049	20,049	22,903	30,187	43,297	49,305	70,905	82,758
Poultry and eggs	5,337	6,313	6,881	8,747	13,546	16,109	22,022	28,997
Seafood	1,432	1,799	1,969	2,557	4,260	5,668	7,801	8,519
Milk	10,615	11,740	12,636	15,024	22,377	26,864	36,323	47,826
Fruits and vegetables	14,392	17,187	17,700	21,605	32,083	38,734	52,098	71,296
Grain	6,616	7,790	8,425	9,317	16,414	17,464	24,332	34,333
Sweeteners	7,163	9,446	10,385	13,581	26,801	30,494	43,417	49,267
Fats and oils	3,068	4,048	4,546	5,695	11,121	12,244	17,651	20,497
Nuts	1,943	1,598	1,615	2,071	4,005	4,574	5,758	7,655
Coffee, tea, and cocoa	2,141	2,558	2,525	3,617	7,207	12,033	14,885	14,367
Other	375	455	493	798	1,773	2,300	3,372	18,592
Total	69,131	82,983	90,028	113,199	182,884	215,789	298,564	384,107

Note: See app. table 9 for annual data. These figures are for all identifiable uses of the farm product, such as grain in bakery products, cereals, soups, and other foods.

USES OF THE INFORMATION

By using the measures discussed in the preceding section, we can conduct a number of analyses. This section discusses several.

Origin of Food

Retail food prices and supply-utilization tables for all food commodities allow one to categorize the origin of food as home production, U.S. farms, or other foods (which includes fish, imports, yeast, and baking powder).

Table 13--Expenditures for purchased foods (excluding food produced at home) by consumer product group

Consumer product group	Annual sales			Share of total sales		
	1967	1977	1982	1967	1977	1982
	Million dollars			Percent		
Meat products	21,973	46,247	74,488	24.4	21.6	22.1
Poultry products	3,313	8,629	15,297	3.7	4.0	4.5
Seafood	1,968	5,668	7,165	2.2	2.6	2.1
Eggs	2,163	3,601	4,396	2.4	1.7	1.3
Fluid milk products	6,930	12,403	17,755	7.7	5.8	5.3
Manufactured dairy products	5,215	12,965	25,622	5.8	6.1	7.6
Fruits and vegetables:						
Fresh	9,534	16,388	22,677	10.6	7.7	6.7
Processed	6,055	15,375	27,217	6.7	7.2	8.1
Pickles, preserves, and cider	877	1,838	10,939	1.0	.9	3.2
Canned, frozen, and dried specialties	2,971	9,426	13,285	3.3	4.4	3.9
Bakery products	9,384	20,674	28,918	10.4	9.7	8.6
Grain mill products	4,136	8,504	15,948	4.6	4.0	4.7
Sweeteners	1,076	6,289	6,567	1.2	2.9	1.9
Confectioneries, desserts, chocolate, gum, nuts, and syrups	4,365	18,280	20,945	4.9	8.5	6.2
Fats, oils, sauces, salad dressings, and peanut butter	2,512	6,740	7,769	2.8	3.1	2.3
Beverages	5,826	18,558	30,391	6.5	8.7	9.0
Other	1,712	2,360	8,554	1.9	1.1	2.5
Total	90,010	213,945	337,933	100.0	100.0	100.0

Note: These figures are for familiar consumer food products. Bakery products, for example, include the flour and all other ingredients used in their manufacture. Flour and flour mixes used in home baking are in grain mill products.

In 1869, 33 percent of all U.S. food never entered the marketing system. That food was produced and consumed by the same household, 10 percent by nonfarm households and 23 percent by farm families (fig. 3). Nonfarm home production includes game fish and animals for both nonfarm and farm families.

Home production has generally declined and now accounts for only 2 percent of food expenditures. Most home production now comes from nonfarm family gardens.

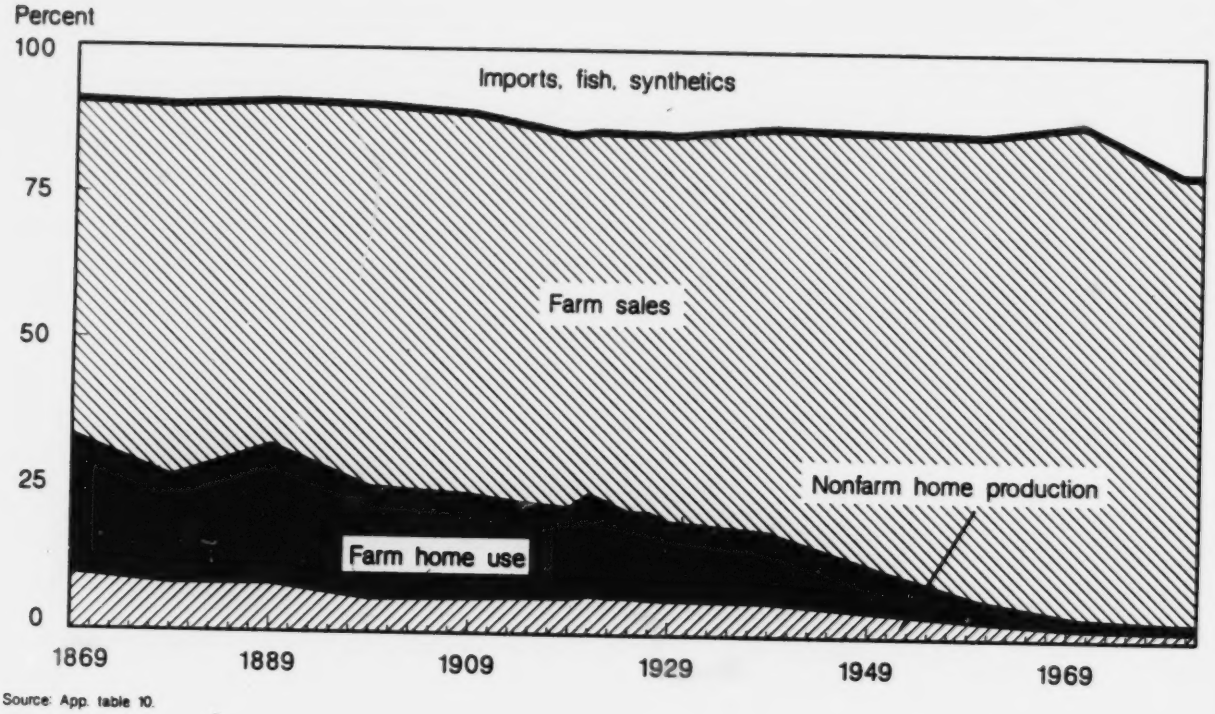
Most of the rest of the food comes from farm sales, but other products--imported foods, fish, and a few other nonfarm foods--accounted for 9-10 percent, mostly imported sugar, of the total in the 19th century. Imports and fish accounted for 12-14 percent of the total during 1914-70, sharply increasing by 1980 primarily because of much higher prices for fish and imported foods such as sugar and cocoa.

For a few individual products, chiefly milk, eggs, pork, and poultry, which were once widely produced for home consumption both by farm and nonfarm families, trends in consumption levels differ markedly when one separates home production from the commercial market.

The widest differences in consumption trends are found for fluid milk products (fig. 4). In 1910, about 37 percent of the population was consuming milk from the family cow or cows. Consumption levels in these households were more than twice as high as in households that purchased milk. Nearly 25 percent of home production was in nonfarm households. The proportion of households with a cow declined to about 28 percent in 1920, 20 percent in 1930 and 1940, 11 percent

Figure 3

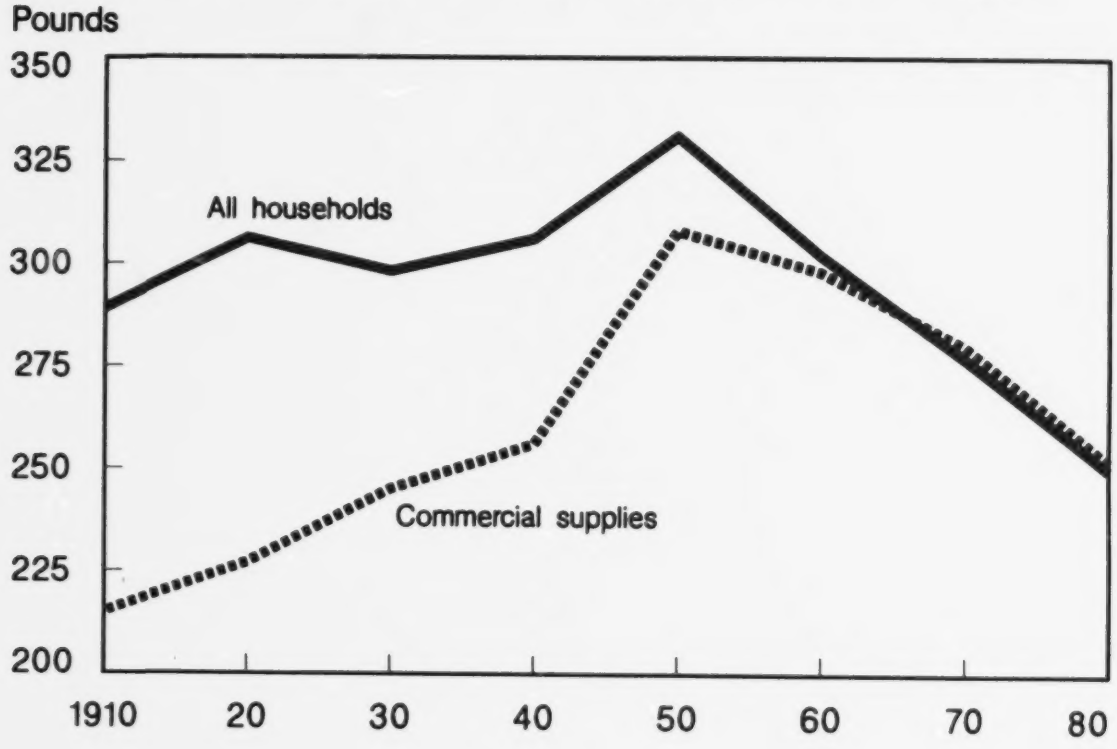
Origin of food

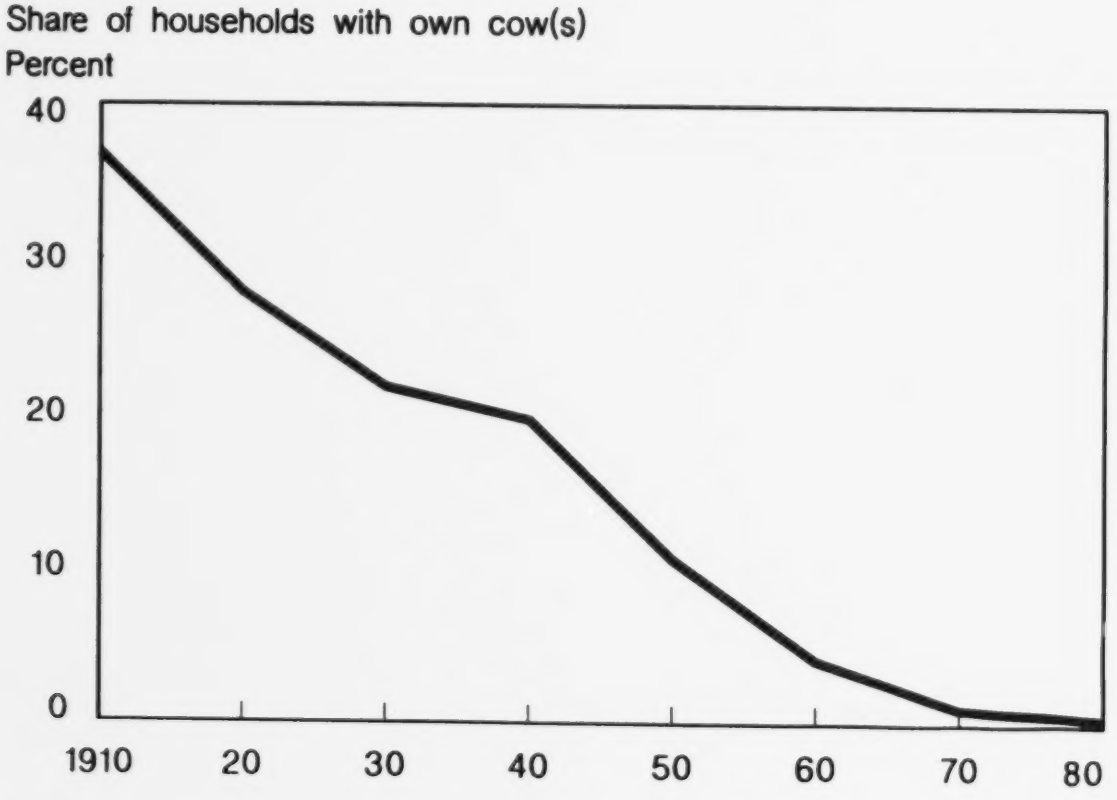


Source: App. table 10.

Figure 4

Per capita consumption of fluid milk, by source of supply





in 1950, and less than 1 percent in 1980. Since 1960, per capita milk consumption of all households has been about the same as that of households purchasing milk.

Home production and consumption of eggs are different. Although about 43 percent of all households raised chickens in 1910, calculated consumption levels were higher among those buying eggs than among those with their own flocks (fig. 5). Differences narrowed by 1930, and per capita consumption levels have been similar since then.

More than 60 percent of farm households and a few nonfarm households raised hogs in 1910. Households that raised hogs consumed about 50 percent more pork than did households that purchased pork (fig. 6). The proportion of farm families raising hogs stayed at about 50 percent through 1960, but has dropped since then.

Manufactured and Fresh Foods

The relative proportions of manufactured and fresh foods in the American diet have not changed as much as one might expect in more than a century. Fresh food accounted for 27 percent of food expenditures in 1869 and manufactured food for the remaining 73 percent. But not all manufactured foods came from factories. Manufactured products such as dressed meat, butter, and cheese produced on the farm or by retail butchers accounted for 49 percent of total food expenditures in 1869 (fig. 7). Only 15 percent was consumed on the same farm where produced. About 70 percent of the fresh products (fresh fruit and vegetables, eggs, fresh fish, game, and home-produced milk) were consumed where produced.

Commercial sales of fresh products increased substantially, from 8.5 percent in 1869 to 15.6 percent in 1909, mostly because of rapid growth in specialized truck farming and fruit growing. The development and introduction of refrigerated railroad cars made possible the movement of fresh fruits and vegetables thousands of miles.

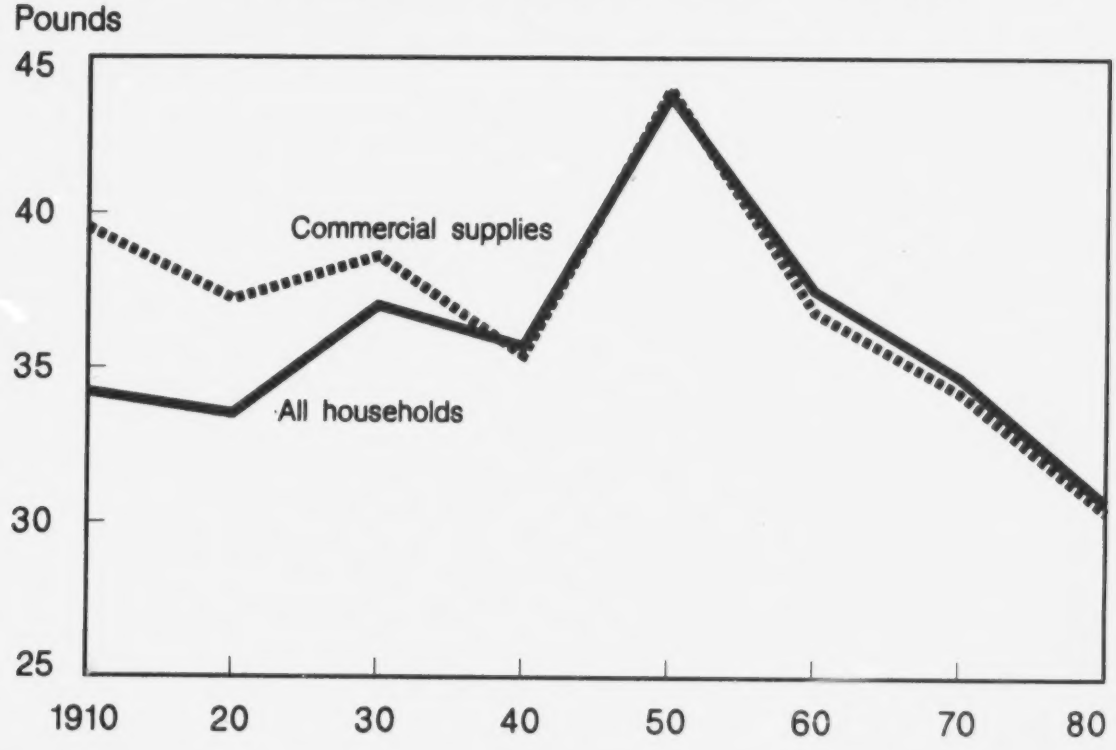
Sales of fresh products held at 13-14 percent of total food expenditures into the 1950's and gradually declined to 10 percent in 1980. The share of manufactured food products coming from farm and retail sources is now insignificant. About all that is left on the farm is some fluid milk sold by producer-dealers and a little meat, most of which is custom slaughtered by locker plants. At retail, instore bakeries in supermarkets and fancy ice cream parlors show growing sales, and retail bake shops are regaining popularity.

The composition of consumer food products produced by manufacturers has changed dramatically over the years. In 1869, most fresh (chilled) meat was slaughtered and sold by retail butchers. Dressed poultry was not even enumerated in the Census of Manufactures until after 1909. The only factory dairy products were butter and cheese, although most of those products were still produced on the farm. Factory production of butter did not surpass that on farms until 1917. The important manufactured products were flour, corn meal, and other grain mill products which accounted for more than half of the total. The next most important product was sugar (table 14).

Flour and other grain products peaked at nearly 17 percent of total food supply in 1919, including substantial quantities produced for export to

Figure 5

Per capita consumption of eggs, by source of supply



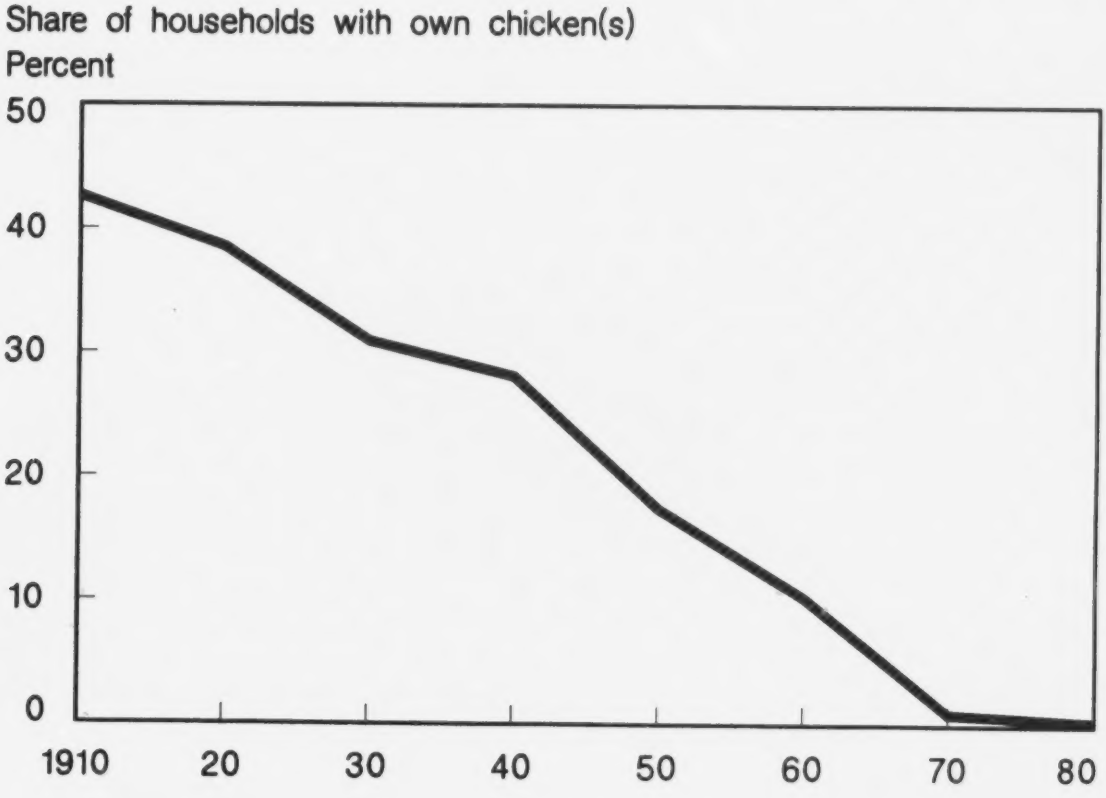
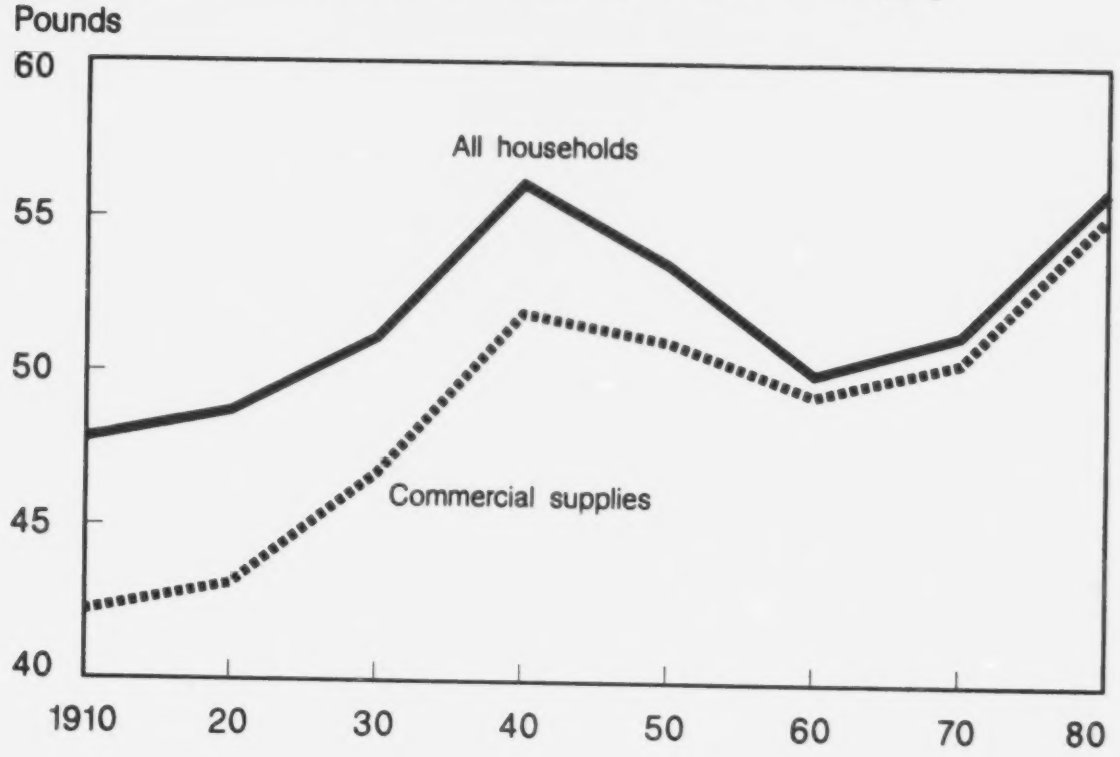
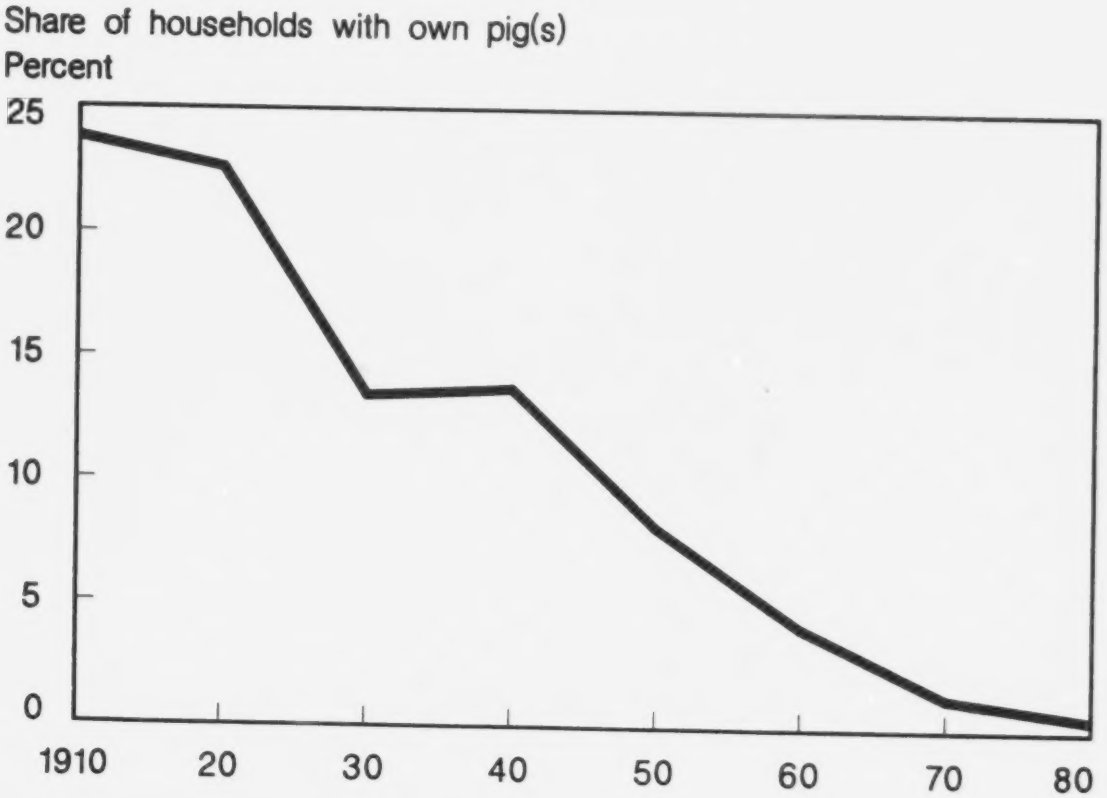


Figure 6

Per capita consumption of pork, by source of supply





war-torn Europe. Since World War II, flour and related products have accounted for about 3 percent of manufacturers' shipments. The value of baked goods, including cookies and crackers, is now much greater than that of consumer flour-related products. The shift in baking from home to factory is clearly reflected in these figures. In the 1970's, the most important product group was fresh meat and poultry; fruits, vegetables, and specialty foods were also large.

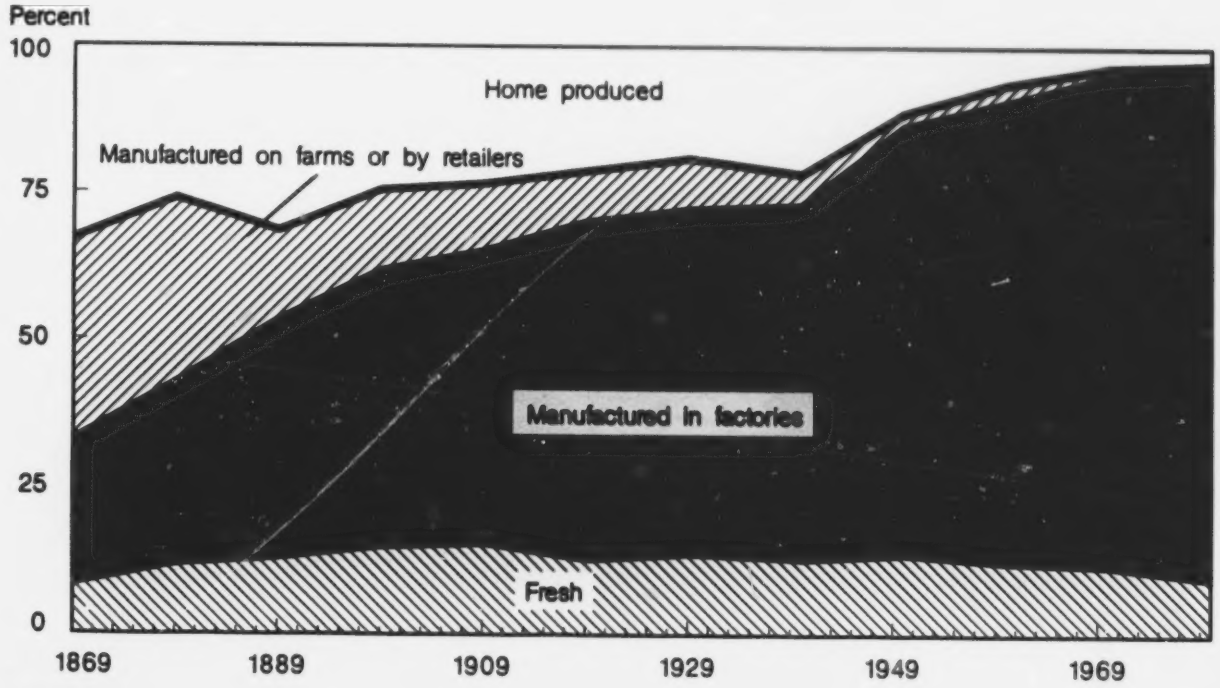
Consumer foods are far from the only products of the food and kindred products industry, as it is defined for census purposes (table 15). Other final products include alcoholic beverages, pet foods, prepared animal feeds, and ice. These products accounted for nearly $38 billion in 1982. Intermediate products used in the manufacture of food have been at least 25 percent of final food products since 1939.

Who Pays for Food?

In 1985, families and individuals paid $346 billion out of their own pockets for food consumed at home and away from home, plus a relatively small part of the 8 billion dollars' worth of home-produced food (such as for seed, fuel, and feed). Local, State, and Federal governments paid $24 billion for food and businesses paid an additional $34 billion.

Figure 7

U.S. food supply: Manufactured vs. fresh food



Source: App. table 11.

In 1985, the Federal share included $18 billion for food stamps and donated foods, the cost of feeding the armed forces and prisoners in Federal institutions. Businesses pay for meals that they supply to their employees in restaurants and in institutions, business lunches, and meals on business trips. Federal, State, and local governments share part of the cost of the school food programs.

Leaving aside home-produced food, the share of all food at home and away from home paid for by families and individuals has gone down over the last half century, while the shares of both governments and businesses have increased (app. table 13).

Most of the data for the foregoing calculations are readily available as components of the food expenditure series. The one missing item is business expenditures for meals, either when traveling or entertaining clients. The figures used here are based on the expenditures for meals and snacks by families and individuals, as reported in the consumer expenditure surveys of 1950-51, 1960-61, and 1972-74 (USDL, BLS). Figures from the most recent Consumer Expenditures Survey, which is a continuing survey starting in 1980, have not yet been incorporated. In some years, those represented only the U.S. urban population.

Income and Expenditures

The share of income going for food is an indicator of affluence, either of a family or a nation. The figure has sometimes been misused to prove that food is a bargain, on which topic it provides no evidence at all.

Several problems, with no obvious answers, arise in making such a comparison. Each of these can be handled in more than one way, and alternative measures are given here.

Food produced at home is a small part of the total in recent years, but it was a major component of the food supply for most of our history. There is no completely satisfactory way of handling home-produced food in a comparison with income. It can be valued at the prices at which it could be purchased, as it is in this basic food expenditure series, or at the prices at which it could be sold. In either case, the value must be included in both expenditures and income. Because home-produced food is a larger proportion of food expenditures than of income, valuing home-produced food at retail rather than farm prices will increase the share of income spent for food over the years. If a measure of the out-of-pocket cost of home-produced food were available, a third comparison would be possible.

Valuing home-produced food at retail prices raises the calculated percentages of income spent for food by families and individuals, compared with valuing at farm prices (compare columns 2 and 3 in table 16). The difference was 2.4 percentage points in 1929, 2.3 in 1939, 0.7 in 1959, and 0.2-0.3 in the 1970's and 1980's. The difference was much larger in the 19th century when home-produced food was much more important. Valuing home-produced food at farm prices instead of retail prices in 1869 reduces the percentage of income spent for food from 60.6 percent to 50.9 percent.

The third problem area is food stamps. Until 1979, the Government's contribution of bonus stamps was tied to a purchase requirement. A recipient

Table 14--Value of shipments of consumer food products by manufacturers

Year	Fresh meat and poultry 1/	Processed and cured meat, poultry, and eggs 2/	Dairy products 3/	Fruits, vegetables, and specialty foods	Grain mill products	Bakery, cookies, and crackers	Sugar and confectioneries	Soft drinks and flavorings	Other food products	Total
					Million dollars					
1869	4/	4/ 70	56	9	335	37	113	5	19	644
1879	72	174	102	27	377	66	147	6	41	1,012
1889	209	279	163	52	378	128	134	18	94	1,455
1899	288	343	338	97	381	175	255	31	137	2,045
1909	483	530	587	161	601	396	384	59	258	3,459
1919	1,319	1,981	1,387	630	1,719	1,151	1,281	191	974	10,606
1929	1,531	1,311	2,497	753	566	1,515	933	265	963	10,334
1939	885	934	1,990	687	407	1,403	660	391	680	8,037
1947	4,809	3,104	5,135	2,254	845	2,766	1,724	811	2,410	23,858
1950	5,310	3,098	5,006	2,681	851	3,290	1,649	898	2,981	25,764
1954	6,314	3,807	6,146	3,390	918	3,817	1,838	1,161	4,446	31,837
1958	7,791	4,182	7,048	4,521	1,048	4,544	2,154	1,515	4,788	37,581
1963	8,582	4,090	7,656	5,710	1,216	4,968	2,493	2,288	5,340	42,343
1967	11,392	5,192	8,697	7,440	1,471	5,671	3,039	3,254	6,684	52,840
1972	15,286	7,188	10,830	10,331	1,686	6,894	4,648	5,115	9,447	71,963
1975	21,716	10,391	14,755	15,438	3,068	10,313	5,603	8,199	13,812	103,295
1977	20,509	11,467	17,847	17,419	3,503	10,778	8,097	9,201	18,388	117,209
1978	24,285	13,536	19,014	20,027	3,720	11,318	6,921	10,453	20,502	130,776
1982	27,962	18,003	27,736	26,463	7,526	15,416	9,450	16,726	23,154	171,436

1/ Excludes poultry, 1869-1909.
2/ Includes substantial production of processed meat i packer branch houses through 1947.
3/ Ice cream included in sugar and confectioneries, 1869-1909; includes fluid milk products by commercial processors in all years.
4/ Fresh meat included with processed meat.

Table 15--Value of product shipments by the food and beverage manufacturing industries

Year	Final products						Other products and materials					All products
	Foods	Alcoholic beverages 1/	Pet foods 2/	Prepared feeds	Ice	Total	Food 3/	Alcoholic beverages	Feed	Nonfood	Total	
	Million dollars											
1869	644	126	--	2	*	772	41	36	52	31	160	932
1879	1,012	182	--	*	1	1,195	106	45	61	46	258	1,453
1889	1,455	319	--	3	5	1,782	164	92	65	54	375	2,157
1899	2,045	449	--	8	13	2,515	260	83	118	100	561	3,076
1909	3,459	684	--	23	44	4,210	530	131	283	198	1,142	5,352
1919	10,606	700	--	156	139	11,662	1,849	65	745	821	3,480	15,142
1929	10,334	14	--	495	209	11,052	1,642	0	342	307	2,291	13,346
1939	8,037	1,396	34	412	123	10,000	2,048	69	327	205	2,650	12,652
1947	23,858	4,740	96	2,113	264	31,071	8,469	429	2,260	330	11,488	42,559
1950	25,764	5,050	152	2,086	151	33,203	7,167	435	2,043	284	9,929	43,132
1954	31,837	5,620	242	2,601	133	40,433	8,341	210	1,633	319	10,503	50,936
1958	37,581	6,108	305	2,771	115	46,880	9,141	211	1,731	307	11,390	58,270
1963	42,343	7,224	436	3,241	95	53,274	11,162	220	2,388	394	14,164	67,503
1967	52,840	8,773	716	3,815	86	66,124	12,752	257	2,834	805	16,648	82,518
1972	71,963	11,968	1,326	4,783	106	90,146	17,876	467	6,132	1,334	25,809	115,955
1975	103,295	14,577	2,287	7,069	115	127,343	30,900	913	6,136	1,682	39,631	166,974
1977	117,209	16,050	3,071	8,350	141	144,821	29,281	961	7,477	3,313	41,032	185,853
1978	130,776	17,652	3,266	8,484	152	160,330	32,682	919	7,891	3,876	45,368	205,698
1982	171,436	22,551	4,157	10,771	227	209,142	43,084	1,585	10,900	1,603	57,172	266,314

-- = Not available.
* Less than 0.5 million.
1/ Including Federal, State, and local excise taxes.
2/ Included in prepared feeds, 1869-1929.
3/ Excludes bulk milk, 1869-1947.

family had to commit a portion of its own resources to the purchase of food in order to receive the Government contribution. Perhaps 60-70 percent of the Government's contribution resulted in increased food expenditures. With the removal of the purchase requirement, food stamps are effective in increasing food expenditures only for the poorest of the poor. Those persons above the minimum poverty level effectively receive an income supplement, and the effect on their food purchases is no different from that of a cash payment. These computations both include and exclude food stamps, with a similar amount included or excluded from income.

Adding food stamps both as an expenditure and income lowers the percentage of income spent for food (compare columns 3 and 4 of table 16). The experimental program lowered the share by 0.1 percentage point in 1940 and 1943. The pilot program of the 1960's had little effect, but the national program of the 1970's and 1980's lowered the share by 0.3-0.4 percentage point.

By all measures, the percentage of income spent for food has generally declined over the years. Since 1948, that share has declined in all but 3 years. Food expenditures by families and individuals ranged from 12.3-12.9 percent of income after taxes in 1985, depending on the treatment of these three areas.

Table 16--Food expenditures as a percentage of income, various measures

Year	Total food expenditures 1/	Expenditures by families and individuals with home-produced food valued at--		
		Farm prices	Retail prices	
		Food stamps excluded	Food stamps excluded	Food stamps included
		Percent		
1869	60.6	--	--	--
1879	56.5	--	--	--
1889	34.0	--	--	--
1899	31.9	--	--	--
1909	29.6	--	--	--
1919	30.6	--	--	--
1929	28.3	24.2	26.6	26.6
1939	26.1	21.9	24.2	24.2
1949	25.9	22.3	23.6	23.6
1959	20.6	18.0	18.7	18.7
1969	16.2	14.2	14.5	14.5
1979	15.9	13.7	14.0	14.3
1985	14.5	12.3	12.6	12.9

-- = Not available.

Note: See app. table 14 for annual data since 1939. Income is disposable personal income (after taxes) adjusted for the method of valuing home-produced food and for food stamps, as appropriate.

1/ With home-produced foods at retail prices.

The only comparison before 1929 is for total food expenditures. It is not a "correct" comparison because it compares food expenditures from all sources, including governments and businesses, with the income of families and individuals. However, governments and businesses were less important participants before the Great Depression, so the comparison is not too bad (compare columns 1 and 3 of table 16). The difference was 1.7 percentage points in 1929.

Who Gets What?

Total expenditures for all purchased foods (excluding food produced at home) were $338 billion in 1982. Out of this total, $94 billion went to U.S. farmers, U.S. fishermen, and importers (table 17). A total of $244 billion went to food processors, wholesalers, retailers, and food service operators. These figures include expenditures for food by both civilian and military installations, regardless of who paid for it, and include food produced on U.S. farms, fish, and imports. The food groups shown in table 17 relate to the origin of the products; in other words, all of the uses of meat products are compared with the farm or import value of meat. These calculations make extensive use of data such as that in table 5 (updated to 1982) on the value at retail store prices.

Meat in all products brought $78 billion, 23 percent of the expenditures for all purchased food. The other groups had the following shares:

	Percent
Poultry and eggs	7
Seafood	2
Dairy	13
Fruits and vegetables	19
Grains	9
Other products	27

From 1960 to 1984, the farm value or equivalent of all food sold for domestic consumption increased 321 percent, the marketing bill 527 percent, and expenditures 444 percent (table 18). Much of the increase in the marketing bill is attributable to the great increase in eating out with the higher margins of food service establishments.

Outlets

Because the food expenditure series is built up from the sales of each type of store or other outlet, changes in the shares of different types of outlets are easily determined. But grocery stores include supermarkets, convenience stores, and other intermediate types of grocery stores. Breaking down the sales of grocery stores into these components requires some additional information. Convenience stores are defined by industry practice, and estimates of their sales are available from Progessive Grocer magazine. These data are used here. Supermarkets have been defined by industry practice in terms of minimum level of annual sales. Originally $250,000 in the 1930's, the level has most recently been raised to $2 million. Adjustments have been

made at discrete intervals, with resulting discontinuities in the definition of a supermarket. I have used an alternative approach. A supermarket is defined as a grocery store with annual sales of $1 million or more in 1972. An index of the prices of all items sold in grocery stores was constructed, and minimum sales in all other years defined in then-current dollars. Thus, the minimum size in sales of a supermarket in 1982 was $2.3 million, while in 1939 it was $287,500 (table 19).

Although in 1929 there were a few grocery stores with sales of more than $401,000, probably none of them had the other features of a supermarket, especially a self-service meat department. Supermarkets were basically a Great Depression development, with the emphasis on low operating costs and low prices. After World War II, the supermarket boom really took off. In 1982, 61 percent of all food sales for home use were through supermarkets (table 20).

Convenience stores were developed in the late 1950's, starting in the South and West. Many started as dairy stores, with milk products accounting for as much as 40-50 percent of their sales. Dairy products still play an important part in convenience store sales, but few of these stores have their sales concentrated as much as was once the case. In the last decade, the fastest growing items in convenience stores have been gasoline and carryout foods, including hot sandwiches.

Specialty food stores such as meat markets, bakeries, fruit and vegetable stores, and candy stores lost ground to the growing supermarkets for many years. Their share has declined irregularly.

In 1929, most of the "other stores" were general stores, the majority of which are gone now.

Home delivery, mostly of milk but also of bread and some grocery products, has been declining since 1939. The mail order share is small.

The most striking development in the away-from-home food market is the growth of fast food places (table 21). Their share has grown from 5 percent in 1958 to 30 percent in 1982. More traditional restaurants, lunchrooms, cafeterias, and caterers still have 40 percent of the market. Hotels and motels have had about 5-6 percent of the market since the mid-1950's, down from 10-11 percent in the 1930's. Schools and colleges peaked at 14 percent in 1967 with the baby boom of the post-World War II years and were about 10 percent of the total in 1982.

The foodservice market has been growing more rapidly than the offpremise food market since the Great Depression. Food service now accounts for 43 percent of all food dollars, compared with 19 percent in 1939 (fig. 8). Because the margins in food service are substantially higher than those in the offpremise market, the share of food at the same price level is somewhat less, 30 percent in 1984 and 17 percent in 1939.

The most important factor leading to the rising share of food service in food sales has been consumer income, which increased in nominal and real terms most of the time since the Great Depression (Lamm, 1982, p. 20). The sharp increase in the proportion of women working outside the home has contributed to both the rise in income and the demand for eating out.

Table 17--Farm value or equivalent, marketing bill, and expenditures for all foods sold for domestic consumption, by farm product group, 1982

Item	Meat products	Poultry products	Seafood	Dairy products	Fruits and vegetables	Grain products	Other products	Total
				Million dollars				
Farm value or equivalent	35,171	8,660	4,642	17,791	14,181	8,424	5,244	94,113
Marketing bill	42,504	15,307	2,371	25,106	48,820	21,943	87,632	243,683
Total expenditures	77,675	23,967	7,013	42,897	63,001	30,367	92,876	337,796

Table 18--Farm value or equivalent, marketing bill, and expenditures for all food sold for domestic consumption

Year	Farm value or equivalent	Marketing bill	Expenditures	Share of expenditures: Farm value or equivalent	Share of expenditures: Marketing bill
	Million dollars			Percent	
1960	24,612	44,519	69,131	35.6	64.4
1965	28,404	54,579	82,983	34.2	65.8
1970	37,233	75,966	113,119	32.9	67.1
1975	62,289	120,595	182,884	34.1	65.9
1980	93,426	205,138	298,564	31.3	68.7
1984	103,522	279,127	382,649	27.1	72.9

Note: See app. table 15 for annual data.

Table 19--Supermarkets

Year	Annual sales to be classed as a supermarket 1/	Number	Sales	Share of all grocery stores: Number	Share of all grocery stores: Sales
	1,000 dollars	Thousands	Million dollars	Percent	
1935	302.9	386	202	0.1	3.2
1939	287.5	1,699	772	.4	10.0
1948	635.6	5,600	5,654	1.6	22.8
1954	703.4	10,506	14,214	3.8	41.3
1958	747.0	15,282	23,562	5.9	53.9
1963	762.9	21,167	31,484	8.6	59.9
1967	825.7	23,808	43,433	10.9	66.7
1972	1,000.0	27,231	64,960	14.0	69.6
1977	1,545.3	30,831	113,111	17.2	75.0
1982	2,313.2	26,640	175,655	14.4	74.5

1/ 1972 = $1 million; other years calculated using an index of prices of all products sold in grocery stores. Sales include sales taxes.

In recent years, the competitive battle among food outlets has increasingly become one of supermarkets versus fast food outlets. During the postwar supermarket boom, real food sales in supermarkets grew at a rate of 13-15 percent per year until the mid-1950's. Sales of nonfoods grew even faster. During the 1960's, the rate of increase slowed to 4-5 percent as overstoring (a saturation of available supermarket sites and of the market for their wares) became a problem. The 1970's brought a further slowing of the rate to less than 1 percent per year in sales of both food and nonfood. Even these modest increases are due largely to the addition of more services such as salad bars, instore bakeries, delicatessens, and eating facilities.

The fast-food boom came later, with sharp increases in the 1960's and early 1970's. That boom too has slowed as available sites filled and strings of fast-food places lined the highways and city streets. Fast-food outlets have emulated the supermarkets and sought to continue growth by tapping other markets. An increasing share of their sales is for offpremise consumption, reaching 34 percent of 1982 sales.

Thus, supermarkets and fast food outlets are edging into each other's territory. Convenience stores are also becoming more like fast-food outlets.

The amount of money spent in food service establishments is a smaller share of the food expenditures of individuals and families than it is of total food expenditures. Governments account for much of the expenditures on food service in institutions, and businesses account for much of the expenditures in eating and drinking places. The share of personal food expenditures for food consumed away from home increased from 14.5 percent in 1929 to 20 percent in 1960, to 30 percent in 1975, and to 38 percent in 1985 (fig. 9).

Table 20--Sales of food for home use by type of outlet

Year	Super-markets	Conven-ience stores	Other grocery stores	Specialty food stores	Other stores	Home-delivered, mail order	Farmers, processors, wholesalers, other
				Percent			
1929	0	0	48.0	17.0	13.3	13.8	7.9
1939	5.8	0	52.4	14.1	7.7	14.9	5.1
1948	14.9	0	51.1	14.6	5.1	11.2	3.1
1954	28.1	0	42.9	11.8	4.5	8.9	3.8
1958	36.5	.1	37.0	11.2	4.7	7.3	3.2
1963	45.4	.7	31.1	8.4	5.9	5.3	3.2
1967	52.2	1.2	25.8	8.3	5.6	4.2	2.7
1972	56.0	2.3	22.9	8.6	5.1	2.9	2.2
1977	61.2	3.2	18.2	7.6	5.9	1.7	2.2
1982	61.4	4.4	17.9	7.2	5.6	1.3	2.2

Marketing Services

The marketing process for food consists of the addition of services to the basic commodities produced by farmers and fishermen here and abroad, including assembly, processing, transportation, and distribution. The output of marketing services can only be measured by indirect means, in contrast with the physical output of farming. A measure, in constant 1980 dollars, is obtained by valuing the marketing bill for all domestic food, the difference between the farm value (or equivalent for fish and imported foods) and expenditures, at 1980 prices.

In 1960, marketing services per person were 87.6 percent of the 1980 level and increased to 97.5 percent in 1972, dipped in 1973-75, and have changed little since then (fig. 9 and table 22). Over the same period, the real price of marketing services increased only 1.3 percent between 1960 and 1982, having peaked in 1971 at 5.7 percent higher than in 1960.

Labor productivity (output of food marketing services per hour of labor) increased sharply in the early 1960's, somewhat more modestly in the middle and late 1960's and early 1970's, peaking in 1972 at 108.9 percent of the 1980 level (fig. 10 and table 22). Productivity then declined until 1980, but recovered somewhat in 1981-82.

Because food service is more labor-intensive than other facets of food marketing, one would anticipate that the increasing share of away-from-home eating would hinder the growth of overall labor productivity in food

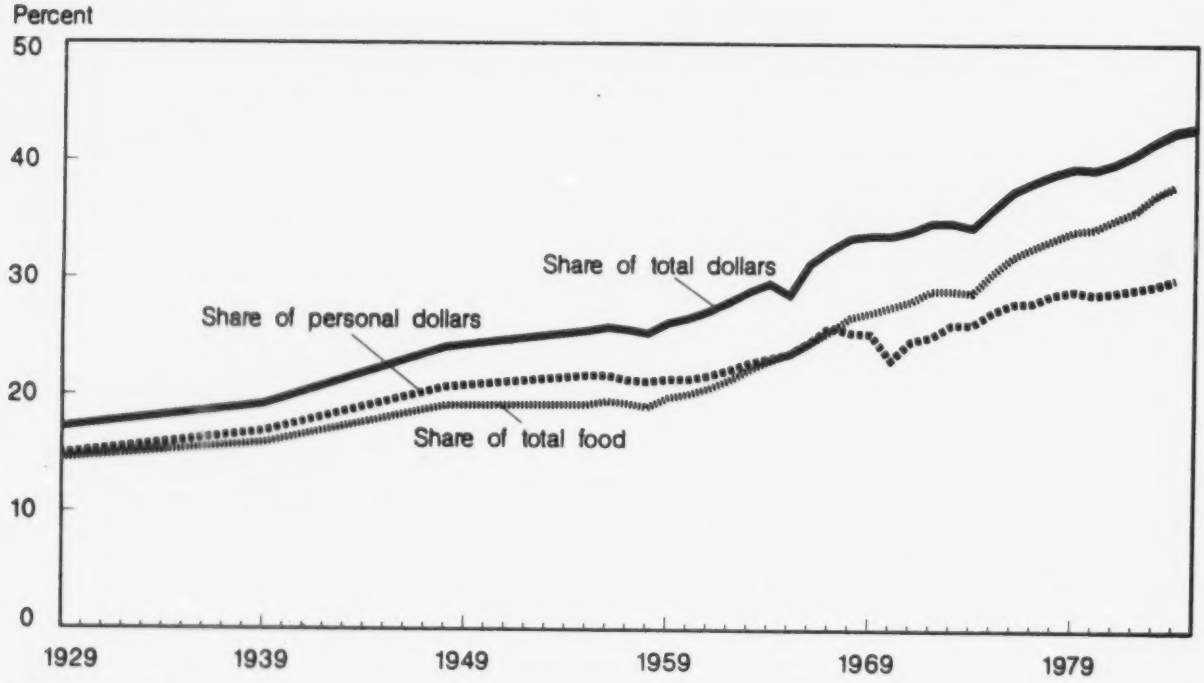
Table 21--Sales of away-from-home food, by type of outlet

Year	Restaurants, lunchrooms, cafeterias, caterers 1/	Fast food places	All eating places	Hotels and motels	Schools and colleges 2/	Stores, bars, and vending machines	Recreational places	Others including military outlets
	Percent							
1929	51.1	9.0	60.1	10.4	5.0	18.8	1.0	4.7
1939	46.6	7.1	53.7	10.8	6.8	21.1	1.9	5.7
1948	48.3	8.4	56.7	8.4	9.8	17.7	1.4	6.0
1954	54.9	4.3	59.2	6.0	10.4	16.1	2.2	6.1
1958	53.5	5.4	58.9	6.1	12.0	14.7	2.4	5.9
1963	50.1	9.7	59.8	6.2	13.5	12.4	2.5	5.6
1967	46.3	14.3	60.6	6.1	13.7	11.4	2.1	6.1
1972	41.3	21.2	62.5	5.8	13.0	11.4	2.0	5.3
1977	39.1	27.8	66.9	5.4	11.0	8.8	3.4	4.5
1982	40.3	29.6	69.9	5.4	9.8	8.2	2.2	4.5

1/ Excludes contract feeding.
2/ Includes child nutrition subsidies.

Figure 8

Food service as a share of all food



Source: App. table 17.

marketing. The increasing share of the relatively less labor-intensive fast food places might partially offset this tendency, as happened in the 1960's and 1980's, but not so much during 1972-80. Labor productivity in food marketing, excluding food service, increased 25 percent between 1960 and 1971, where it peaked 1.9 percent above the 1980 level. By 1982, productivity had risen 2.7 percent above the 1980 level.

Since 1937, the quantity of food marketing services per person has more than doubled (figs. 9 and 11). The data in these charts are not altogether comparable because of differences both in coverage (farm food versus all food) and in methodology. (See Waldorf, 1966, for the methods used in fig. 11; see also Ladd, 1961 and 1967, Lin and Seaver, 1976, and Waldorf, 1967.)

Between 1929 and 1962, the "real" price of marketing services for farm food (excluding food consumed away from home) declined a bit. "Real" prices fluctuated in the 1960's and then rose fairly sharply in the 1970's.

Waldorf (1966) analyzed the 1929-62 data to estimate price and income elasticities of demand for marketing services for farm food. He used both

ordinary least squares (OLS) and two stage least squares (TSLS). The independent (explanatory) variables included the real price of marketing services for farm food (deflated by the implicit price deflator for gross national product), per capita disposable income in constant dollars, and a time trend. His preferred equation omitted the trend variable and yielded an estimated income elasticity of +0.76. In other words, a 10-percent increase in per capita income was accompanied by a 7.6-percent increase in marketing services. He commented that the income variable should be looked upon as a gross demand shifter.

With the data on marketing services for all food for 1960-82 and the price measures presented in this report, a comparable analysis was performed. The results of that analysis are shown in table 23. The trend over time was significant in only one equation, and it had a negative effect at farm and retail levels and a small positive effect for marketing services. The small coefficients and lack of significance suggest that the trend can probably be omitted, as it was by Waldorf.

The price elasticity for marketing services is -0.06 and the income elasticity 0.30, although only income is significant at either the 5-percent or 10-percent level (equation 1). The associated demands at the farm and retail levels (equations 2 and 3) have the expected signs, and both price and income are significant.

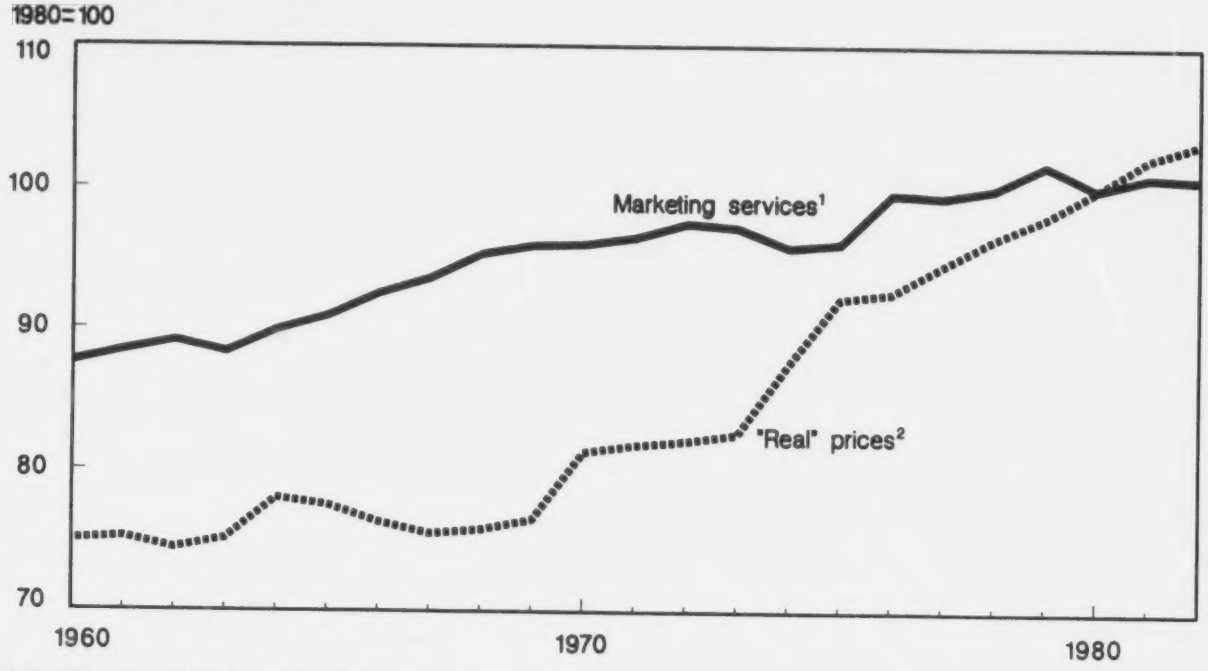
Table 22--Food marketing services for sales for domestic use

Year	Quantity of food marketing services per person 1/		Price of food marketing services		Labor productivity	
	Total	Excluding food service	Nominal 2/	Real 3/	Total	Excluding food service
			1980 = 100			
1960	87.6	98.4	31.2	75.6	92.4	81.6
1965	90.9	98.2	34.3	77.5	99.5	89.9
1970	96.0	103.0	42.9	81.3	106.5	98.5
1975	96.1	97.6	64.2	92.2	104.3	99.2
1980	100.0	100.0	100.0	100.0	100.0	100.0
1982	100.7	99.7	118.9	103.3	100.9	102.7

Note: See app. table 16 for annual data.
1/ Marketing bill at 1980 prices, divided by resident population.
2/ Implicit price deflator for food marketing services.
3/ Nominal divided by implicit deflator for personal consumption expenditures other than food.

Figure 9

Per capita consumption and "real" price of food marketing services



1/ Per capita cost of marketing services in 1980 dollars.
2/ Index of implicit price of food marketing services deflated by the implicit deflator of all goods and services except food and alcoholic beverages.

Figure 10

Labor productivity in food marketing

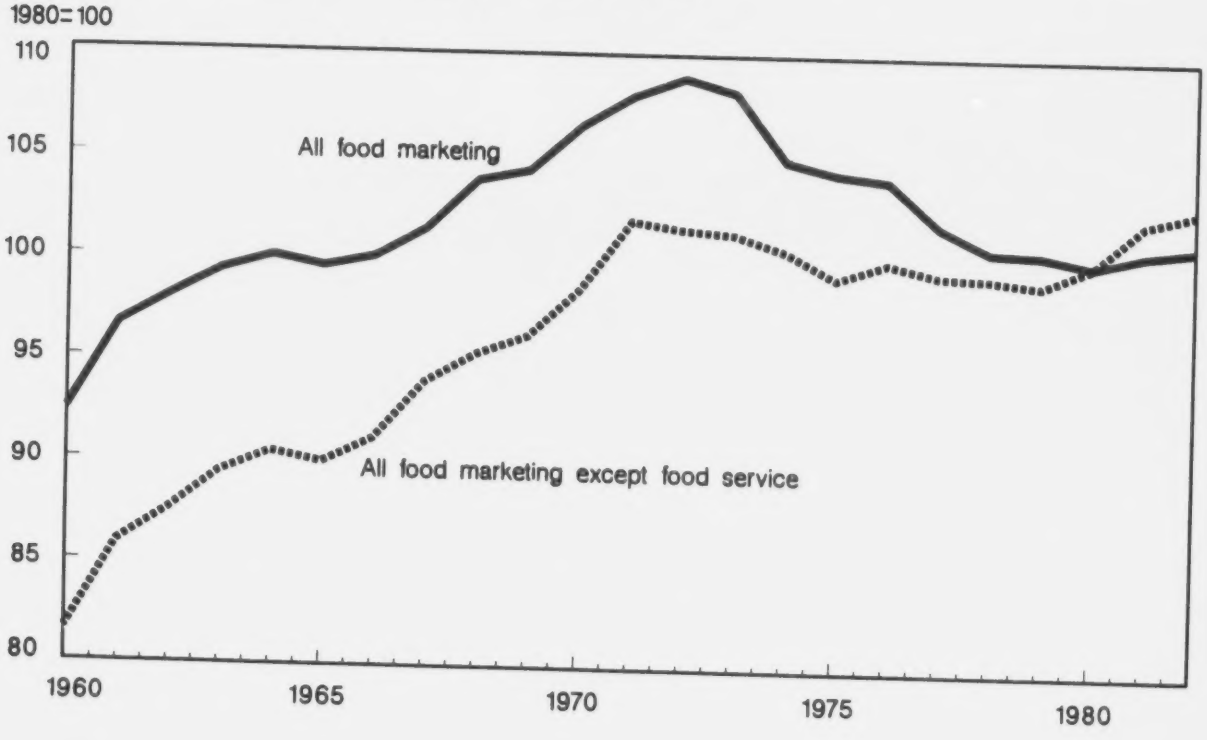


Figure 11

Civilian consumption and "real" price of farm food marketing services

1/ Civilian consumption of farm-food marketing services in 1947-49 dollars.
2/Index of implicit prices of farm-food marketing services deflated by the U.S. Department of Commerce implicit deflator for gross national product.
Source: Adapted from Waldorf (1966), p. 43.

This analysis assumes that the demand for specific marketing services can be differentiated from the demand for the product with which those services are associated. Every product is associated with some services; one cannot buy a food product with no services. Some services are always included; for example, livestock must be slaughtered for meat, although the consumer could purchase the live animal and slaughter it. However, consumers may choose from a wide range of services. They can buy fresh, canned, or frozen vegetables in a wide variety of package sizes, and can buy many with added flavors and ingredients. One can purchase ready-to-bake biscuits, biscuit mix, or the separate ingredients. Away-from-home food service certainly is also available in many configurations. Examples could be multiplied almost without limit. Thus, the joint nature of the offering of a commodity and service does not prevent the consumer from exercising choice over a wide range of marketing services.

Table 23--Estimates of U.S. domestic demand for food marketing services and food products at farm and retail levels, 1960-82

Equation number	Dependent variable	Constant term	Coefficient and standard error (in parentheses) of--					R^2
			Log P_m	Log P_f	Log P_r	Log Y	T	
1	Log X_m	3.208	-0.062 (.037)			0.304* (.024)		0.966
2	Log X_m	3.479	-.113 (.082)			.233* (.105)	0.003 (.004)	.965
3	Log X_f	4.061		-.125* (.054)		.121* (.034)	.325	
4	Log X_f	1.646		-.146* (.028)		.710* (.080)	-.015* (.002)	.848
5	Log X_r	2.981			-.251* (.047)	.354* (.028)		.939
6	Log X_r	2.545			-.196* (.058)	.465* (.078)	-.004 (.002)	.943

* Significant at 5-percent level.

X_m is index of per capita food marketing services at 1980 prices.

X_f is index of per capita consumption of food, weighted by 1980 farm prices (or equivalent).

X_r is index of per capita consumption of food, weighted by 1980 retail prices.

P_m is index of prices of food-marketing services (implicit deflator), deflated by index of prices of all goods and services except food and alcoholic beverages.

Y is per capita disposable income in 1972 dollars.

T is trend (1960 = 1).

Numbers in parentheses are standard errors.

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Appendix table 1--Expenditures for food and alcoholic beverages

Year	Food for offpremise use			Meals and snacks			All food	Alcoholic beverages
	Sales	Food produced at home, donated	Total	Sales	Supplied, donated	Total		
	Million dollars							
1869	2,245	1,194	3,439	--	--	192	3,631	307
1879	2,735	1,063	3,798	--	--	288	4,086	411
1889	2,743	1,405	4,148	--	--	307	4,455	742
1890	2,282	1,416	3,690	--	--	261	3,959	776
1891	2,577	1,494	4,071	--	--	302	4,373	827
1892	2,431	1,410	3,841	--	--	292	4,133	839
1893	3,023	1,548	4,571	--	--	373	4,944	807
1894	2,598	1,306	3,904	--	--	328	4,232	737
1895	2,891	1,410	4,301	--	--	374	4,675	714
1896	2,722	1,172	3,894	--	--	361	4,255	703
1897	3,544	1,311	4,855	--	--	430	5,285	740
1898	3,303	1,273	4,576	--	--	458	5,034	881
1899	3,649	1,350	4,999	--	--	516	5,515	1,008
1900	3,812	1,455	5,267	--	--	546	5,813	1,097
1901	4,333	1,631	5,964	--	--	630	6,594	1,139
1902	4,434	1,749	6,183	--	--	653	6,836	1,128
1903	4,695	1,740	6,435	--	--	700	7,135	1,118
1904	4,857	1,771	6,628	--	--	733	7,361	1,155
1905	5,022	1,701	6,723	--	--	766	7,489	1,273
1906	5,528	1,981	7,509	--	--	854	8,363	1,440
1907	5,904	2,026	7,930	--	--	922	8,852	1,520
1908	5,214	2,079	7,293	--	--	824	8,117	1,502
1909	6,277	2,217	8,494	--	--	1,004	9,498	1,603
1910	6,442	2,437	8,879	--	--	1,052	9,931	1,700
1911	6,688	2,299	8,987	--	--	1,116	10,103	1,732
1912	7,255	2,072	9,327	--	--	1,230	10,557	1,755
1913	7,251	1,975	9,226	--	--	1,251	10,477	1,764
1914	7,231	2,419	9,650	--	--	1,272	10,922	1,724

See note at end of table.

Continued--

Appendix table 1--Expenditures for food and alcoholic beverages--Continued

Year	Food for offpremise use			Meals and snacks			All food	Alcoholic beverages
	Sales	Food produced at home, donated	Total	Sales	Supplies, donated	Total		
	Million dollars							
1915	6,746	2,360	9,106	--	--	1,210	10,316	1,800
1916	8,102	2,655	10,757	--	--	1,481	12,238	2,004
1917	10,620	3,789	14,409	--	--	1,978	16,387	2,705
1918	13,161	4,319	17,480	--	--	2,497	19,977	2,986
1919	14,639	4,706	19,345	--	--	2,830	22,175	1,540
1920	16,811	5,980	22,791	--	--	3,366	26,157	1,250
1921	11,127	4,183	15,310	--	--	2,306	17,616	1,078
1922	11,427	4,223	15,650	--	--	2,463	18,113	1,100
1923	12,568	4,373	16,941	--	--	2,787	19,728	1,155
1924	13,084	4,278	17,362	--	--	2,999	20,361	1,200
1925	14,269	4,570	18,839	--	--	3,382	22,221	1,309
1926	14,736	4,835	19,571	--	--	3,607	23,178	1,350
1927	14,227	4,607	18,834	--	--	3,593	22,427	1,386
1928	14,094	4,062	18,156	--	--	3,674	21,830	1,450
1929	15,319	4,558	19,877	3,496	625	4,121	23,998	1,540
1930	13,891	4,252	18,143	--	--	3,723	21,866	1,400
1931	11,057	3,511	14,568	--	--	2,948	17,516	1,232
1932	8,618	3,022	11,640	--	--	2,287	13,927	1,000
1933	9,192	2,963	12,155	2,048	412	2,459	14,614	800
1934	10,203	3,091	13,294	--	--	2,662	15,956	1,190
1935	10,850	3,613	14,463	2,235	599	2,834	17,297	1,634
1936	11,417	3,575	14,992	2,532	629	3,161	18,153	2,066
1937	11,981	3,614	15,595	2,919	697	3,616	19,211	2,288
1938	11,427	3,272	14,699	2,761	628	3,389	18,088	2,187
1939	11,853	3,331	15,184	2,977	636	3,613	18,797	2,372

See note at end of table.

Continued--

Appendix table 1--Expenditures for food and alcoholic beverages--Continued

Year	Food for offpremise use			Meals and snacks			All food	Alcoholic beverages
	Sales	Food produced at home, donated	Total	Sales	Supplied, donated	Total		
	Million dollars							
1940	12,385	3,499	15,884	3,212	683	3,906	19,790	2,588
1941	13,939	3,851	17,790	3,830	969	4,799	22,589	3,116
1942	16,670	4,332	21,002	4,744	1,550	6,294	27,296	4,003
1943	18,397	4,993	23,390	5,991	2,394	8,345	31,735	5,063
1944	19,900	5,010	24,910	6,749	3,144	9,893	34,803	5,939
1945	21,127	5,309	26,436	7,669	3,566	11,235	37,671	6,878
1946	26,114	6,099	32,213	8,800	2,197	11,032	43,245	7,972
1947	29,845	6,544	36,839	9,633	2,170	12,082	48,471	8,560
1948	31,907	6,706	38,613	9,912	2,324	12,236	50,849	8,739
1949	31,715	5,896	37,611	9,752	2,250	12,002	49,613	8,540
1950	33,231	5,797	39,028	10,071	2,398	12,469	51,497	8,672
1951	37,207	6,364	43,571	11,116	3,130	14,246	57,817	9,461
1952	39,059	6,293	45,352	11,612	3,315	14,927	60,279	9,855
1953	39,802	5,973	45,775	12,009	3,222	15,231	61,006	10,039
1954	40,049	5,679	45,728	12,264	3,153	15,417	61,145	10,174
1955	41,314	5,470	46,784	12,997	3,012	16,009	62,793	10,525
1956	42,925	5,324	48,249	13,775	3,016	16,791	65,040	11,244
1957	45,827	5,293	51,120	14,432	3,113	17,545	68,665	11,796
1958	47,585	5,306	52,891	14,628	3,261	17,889	70,780	12,144
1959	48,076	4,988	53,064	15,582	3,252	18,834	71,898	12,691
1960	49,424	4,697	54,121	16,248	3,359	19,607	73,728	12,932
1961	50,020	4,591	54,611	16,919	3,466	20,385	74,996	12,876
1962	51,052	4,353	55,405	17,998	3,597	21,595	77,000	13,635
1963	51,495	3,980	55,475	18,910	3,647	22,557	78,032	14,133
1964	53,729	3,988	57,717	20,532	3,790	24,322	82,039	14,838

See note at end of table.

Continued--

Appendix table 1--Expenditures for food and alcoholic beverages--Continued

Year	Food for offpremise use			Meals and snacks			All food	Alcoholic beverages
	Sales	Food produced at home, donated	Total	Sales	Supplied, donated	Total		
	Million dollars							
1965	56,602	3,940	60,542	22,179	4,018	26,197	86,739	15,625
1966	59,090	3,815	62,905	24,231	4,470	28,701	91,606	16,717
1967	59,544	3,659	63,203	25,608	4,811	30,419	93,622	17,516
1968	62,816	3,707	66,523	28,396	5,064	33,460	99,983	18,871
1969	67,249	3,849	71,098	30,636	5,479	36,115	107,213	19,942
1970	73,441	4,086	77,527	33,862	5,721	39,583	117,110	22,003
1971	77,366	4,080	81,446	36,096	6,155	42,251	123,697	23,645
1972	83,636	4,297	87,933	40,547	6,040	46,587	134,520	24,636
1973	92,069	5,217	97,286	45,162	7,488	52,650	149,936	26,778
1974	104,138	6,114	110,252	49,188	8,927	58,045	168,297	29,051
1975	113,875	5,975	119,850	58,082	10,027	68,109	187,959	31,794
1976	121,686	6,149	127,984	65,752	10,987	76,833	204,668	33,996
1977	130,524	6,035	136,559	73,259	11,745	85,004	221,563	36,633
1978	143,944	6,476	150,420	83,177	13,056	96,233	246,653	39,998
1979	160,790	6,992	167,782	94,595	14,800	109,395	277,177	44,944
1980	177,654	8,275	185,929	103,980	16,660	120,640	306,569	50,052
1981	189,630	9,280	198,910	113,991	17,873	131,864	330,774	53,662
1982	196,772	9,435	206,207	122,538	18,633	141,161	347,368	55,476
1983	205,839	9,935	215,774	134,915	19,433	154,348	370,122	59,676
1984	217,209	9,324	226,585	146,338	20,560	166,898	393,483	62,582
1985	225,317	7,927	233,244	155,922	21,373	177,295	410,539	65,930
1986	234,837	8,025	242,862	168,311	22,433	190,744	433,606	69,580

-- = Not available.

Appendix table 2--Expenditures for food for offpremise use

Year	Food stores 1/	Other stores 2/	Food delivered to home, mail order	Farmers, manufacturers, wholesalers	Total sales	Food produced at home, donations	Grand total
				Million dollars			
1869	1,692	483	--	--	2,245	1,194	3,439
1879	2,052	552	--	--	2,735	1,063	3,798
1889	2,019	520	--	--	2,743	1,405	4,148
1890	1,657	427	--	--	2,282	1,416	3,690
1891	1,891	486	--	--	2,577	1,494	4,071
1892	1,740	443	--	--	2,431	1,410	3,841
1893	2,240	570	--	--	3,023	1,458	4,571
1894	1,890	477	--	--	2,598	1,306	3,904
1895	2,080	521	--	--	2,891	1,410	4,301
1896	1,924	479	--	--	2,722	1,172	3,894
1897	2,545	629	--	--	3,544	1,311	4,855
1898	2,302	564	--	--	3,303	1,273	4,576
1899	2,562	627	--	--	3,649	1,350	4,999
1900	2,683	656	--	--	3,812	1,455	5,267
1901	3,086	760	--	--	4,333	1,631	5,964
1902	3,155	781	--	--	4,434	1,749	6,183
1903	3,230	804	--	--	4,695	1,740	6,435
1904	3,381	847	--	--	4,857	1,771	6,628
1905	3,509	887	--	--	5,022	1,701	6,723
1906	3,789	964	--	--	5,528	1,981	7,509
1907	4,014	1,028	--	--	5,904	2,026	7,930
1908	3,535	898	--	--	5,214	2,079	7,293
1909	4,229	1,080	--	--	6,277	2,217	8,494

See footnotes at end of table.

Continued--

Appendix table 2--Expenditures for food for offpremise use--Continued

Year	Food stores 1/	Other stores 2/	Food delivered to home, mail order	Farmers, manufacturers, wholesalers	Total sales	Food produced at home, donations	Grand total
				Million dollars			
1910	4,337	1,087	--	--	6,442	2,437	8,879
1911	4,512	1,103	--	--	6,688	2,299	8,987
1912	4,889	1,177	--	--	7,255	2,072	9,327
1913	4,897	1,145	--	--	7,251	1,975	9,226
1914	4,874	1,128	--	--	7,231	2,419	9,650
1915	4,551	1,032	--	--	6,746	2,360	9,106
1916	5,472	1,214	--	--	8,102	2,655	10,757
1917	7,182	1,555	--	--	10,620	3,789	14,409
1918	8,907	1,887	--	--	13,161	4,319	17,480
1919	9,910	2,063	--	--	14,639	4,706	19,345
1920	11,334	2,350	--	--	16,811	5,980	22,791
1921	7,482	1,549	--	--	11,127	4,183	15,310
1922	7,695	1,579	--	--	11,427	4,223	15,650
1923	8,388	1,721	--	--	12,568	4,373	16,941
1924	8,697	1,783	--	--	13,084	4,278	17,362
1925	9,445	1,922	--	--	14,269	4,570	18,839
1926	9,712	1,976	--	--	14,736	4,835	19,571
1927	9,332	1,914	--	--	14,227	4,607	18,834
1928	9,203	1,880	--	--	14,094	4,062	18,156
1929	9,961	2,034	--	--	15,319	4,558	19,877
1930	9,099	1,750	--	--	13,891	4,252	18,143
1931	7,309	1,316	--	--	11,057	3,511	14,658
1932	5,748	965	--	--	8,618	3,022	11,640
1933	6,180	973	--	--	9,192	2,963	12,155
1934	7,009	990	--	--	10,203	3,091	13,294

See footnotes at end of table.

Continued--

Appendix table 2--Expenditures for food for offpremise use--Continued

Year	Food stores 1/	Other stores 2/	Food delivered to home, mail order	Farmers, manufacturers, wholesalers	Total sales	Food produced at home, donations	Grand total
				Million dollars			
1935	7,618	955	--	--	10,850	3,613	14,463
1936	8,046	1,005	--	--	11,417	3,575	14,992
1937	8,498	1,032	--	--	11,981	3,614	15,595
1938	8,153	913	--	--	11,427	3,272	14,699
1939	8,569	914	--	--	11,853	3,331	15,184
1940	9,027	916	--	--	12,385	3,499	15,884
1941	10,290	1,005	--	--	13,939	3,851	17,790
1942	12,350	1,193	--	--	16,670	4,332	21,002
1943	12,630	1,323	--	--	18,397	4,993	23,390
1944	14,945	1,365	--	--	19,900	5,010	24,910
1945	16,009	1,357	--	--	21,127	5,309	26,436
1946	20,351	1,483	--	--	26,114	6,099	32,213
1947	23,768	1,448	--	--	29,845	6,544	36,389
1948	25,711	1,470	--	--	31,907	6,706	38,613
1949	25,707	1,405	--	--	31,715	5,896	37,611
1950	27,115	1,414	--	--	33,231	5,797	39,028
1951	30,447	1,472	--	--	37,207	6,364	43,571
1952	32,028	1,491	--	--	39,059	6,293	45,352
1953	32,827	1,499	--	--	39,802	5,973	45,775
1954	33,140	1,797	3,576	1,536	40,049	5,679	45,728
1955	34,266	1,903	3,577	1,538	41,314	5,470	46,784
1956	35,795	2,044	3,552	1,534	42,925	5,324	48,249
1957	38,610	2,150	3,515	1,552	45,827	5,293	51,120
1958	40,348	2,238	3,462	1,537	47,585	5,306	52,891
1959	40,812	2,427	3,303	1,534	48,076	4,988	53,064

See footnotes at end of table.

Continued--

Appendix table 2--Expenditures for food for offpremise use--Continued

Year	Food stores 1/	Other stores 2/	Food delivered to home, mail order	Farmers, manufacturers, wholesalers	Total sales	Food produced at home, donations	Grand total
				Million dollars			
1960	42,088	2,530	3,288	1,578	49,424	4,697	54,121
1961	42,710	2,621	3,112	1,577	50,020	4,591	54,611
1962	43,689	2,865	2,890	1,608	51,052	4,353	55,405
1963	44,104	3,043	2,726	1,622	51,495	3,980	55,475
1964	46,415	3,116	2,573	1,625	53,729	3,988	57,717
1965	49,076	3,266	2,631	1,629	56,602	3,940	60,542
1966	51,446	3,438	2,517	1,689	59,090	3,815	62,905
1967	52,109	3,318	2,499	1,618	59,544	3,659	63,203
1968	55,198	3,482	2,460	1,676	62,816	3,707	66,523
1969	59,509	3,625	2,379	1,736	67,249	3,849	71,098
1970	65,480	3,765	2,383	1,813	73,441	4,086	77,527
1971	69,161	4,004	2,373	1,828	77,366	4,080	81,446
1972	75,520	3,865	2,423	1,828	83,636	4,297	87,933
1973	83,200	4,556	2,294	2,083	92,069	5,217	97,286
1974	94,529	5,079	2,233	2,199	104,138	6,114	110,252
1975	103,624	5,739	1,976	2,259	113,875	5,975	119,850
1976	110,793	6,283	1,886	2,342	121,686	6,149	127,835
1977	118,256	7,070	2,264	2,934	130,524	6,035	136,559
1978	130,627	7,710	2,385	3,222	143,944	6,476	150,420
1979	146,244	8,411	2,567	3,568	160,790	6,992	167,782
1980	161,723	9,265	2,762	3,904	177,654	8,275	185,929
1981	172,609	10,142	2,729	4,150	189,630	9,280	198,910
1982	179,164	10,777	2,616	4,215	196,772	9,435	206,207
1983	186,829	12,132	2,575	4,303	205,839	9,935	215,774
1984	197,080	13,074	2,571	4,484	217,209	9,324	226,585
1985	204,604	13,657	2,437	4,619	225,317	7,927	233,244
1986	212,913	14,536	2,623	4,765	234,837	8,025	242,862

-- = Not available.

1/ Excludes estimated sales to restaurants and institutions.

2/ Includes eating and drinking establishments and trailer parks; commissary stores and exchanges included, 1954-85.

Appendix table 3--Expenditures for meals and snacks

Year	Eating and drinking places 1/	Hotels and motels 1/	Retail stores, direct selling 2/	Recreational places 3/	Schools and colleges 4/	All other 5/	Total
			Million dollars				
1929	2,101	362	--	--	175	1,483	4,121
1933	1,235	250	--	--	105	869	2,459
1935	1,257	271	--	--	161	1,145	2,834
1936	1,430	320	--	--	175	1,236	3,161
1937	1,696	351	--	--	194	1,375	3,616
1938	1,626	312	--	--	191	1,260	3,389
1939	1,782	321	--	--	203	1,307	3,613
1940	1,938	353	--	--	219	1,396	3,906
1941	2,369	386	--	--	263	1,781	4,799
1942	2,992	453	--	--	310	2,539	6,294
1943	3,837	604	--	--	332	3,572	8,345
1944	4,471	681	--	--	326	4,415	9,893
1945	5,218	736	--	--	373	4,908	11,235
1946	5,859	846	--	--	525	3,802	11,032
1947	6,243	854	--	--	842	4,143	12,082
1948	6,338	846	--	--	983	4,069	13,246
1949	6,294	786	--	--	979	3,943	13,896
1950	6,472	774	--	--	1,051	4,174	12,469
1951	7,172	783	--	--	1,124	5,157	14,246
1952	7,549	805	--	--	1,138	5,435	14,927
1953	7,834	790	--	--	1,215	5,392	15,231
1954	8,008	752	1,416	274	1,311	3,676	15,417
1955	8,490	809	1,468	313	1,390	3,539	16,009
1956	8,992	875	1,534	354	1,530	3,506	16,791
1957	9,409	932	1,592	342	1,661	3,589	17,545
1958	9,447	922	1,599	356	1,809	3,756	17,889
1959	10,102	982	1,677	385	1,949	3,739	18,834
1960	10,505	1,028	1,716	421	2,082	3,855	19,607
1961	10,907	1,061	1,740	452	2,264	3,961	20,385
1962	11,624	1,134	1,812	472	2,463	4,090	21,595
1963	12,247	1,200	1,854	484	2,624	4,148	22,557
1964	13,156	1,289	1,988	496	2,814	4,279	24,322
1965	14,444	1,409	2,162	522	3,062	4,598	26,197
1966	15,768	1,541	2,346	544	3,329	5,173	28,701
1967	16,595	1,623	2,436	563	3,632	5,570	30,419
1968	18,695	1,703	2,713	616	3,903	5,830	33,460
1969	20,207	1,716	2,984	661	4,256	6,291	36,115

See footnotes at end of table.

Continued--

Appendix table 3--Expenditures for meals and snacks--Continued

Year	Eating and drinking places 1/	Hotels and motels 1/	Retail stores, direct selling 2/	Recreational places 3/	Schools and colleges 4/	All other 5/	Total
			Million dollars				
1970	22,617	1,894	3,325	721	4,475	6,551	39,583
1971	24,166	2,086	3,626	762	4,990	6,621	42,251
1972	27,167	2,390	3,811	832	5,370	7,017	46,587
1973	31,265	2,639	4,218	963	5,605	7,960	52,650
1974	34,029	2,864	4,520	1,167	6,287	9,178	58,045
1975	41,384	3,199	4,952	1,369	7,060	10,145	68,109
1976	47,536	3,769	5,341	1,511	7,854	10,822	76,833
1977	52,608	4,115	5,663	2,606	8,418	11,594	85,004
1978	60,190	4,863	6,323	2,795	9,066	12,996	96,233
1979	69,054	5,551	7,157	2,941	9,966	14,726	109,395
1980	76,089	5,906	8,158	3,061	11,212	16,214	120,640
1981	83,597	6,639	8,830	2,967	11,876	17,955	131,864
1982	90,658	6,888	9,246	2,840	12,496	19,033	141,161
1983	100,437	7,561	10,106	3,017	13,269	19,958	154,348
1984	109,155	8,186	10,935	3,166	13,793	21,663	166,898
1985	116,897	8,805	11,350	3,286	14,302	22,655	177,295
1986	126,969	9,300	12,266	3,510	14,916	23,783	190,744

-- = Not available.

1/ Includes tips.

2/ Includes vending machine operators but not vending machines operated by other organizations, since 1954.

3/ Motion picture theaters, bowling alleys, pool parlors, sports arenas, camps, amusement parks, golf and country clubs, since 1954. Includes concessions beginning 1977.

4/ Includes school food subsidies.

5/ Military exchanges and clubs; railroad dining cars; airlines; food service in manufacturing plants, institutions, hospitals, boarding houses, fraternities and sororities, and civic and social organizations; food supplied to military forces and civilian employees; child daycare.

Appendix table 4--Sales of alcoholic beverages

Year	Packaged alcholic beverages				Alcoholic drinks			
	Liquor stores	Food stores	All other	Total	Eating and drinking places 1/	Hotels and motels 1/	All other	Total
	Million dollars							
1935	305	65	199	569	964	81	20	1,065
1936	435	95	220	750	1,195	97	24	1,316
1937	504	113	235	852	1,299	109	28	1,436
1938	479	111	227	817	1,246	98	26	1,370
1939	517	122	237	876	1,365	103	28	1,496
1940	602	140	244	986	1,459	113	30	1,602
1941	758	173	271	1,202	1,753	124	37	1,914
1942	1,081	243	311	1,635	2,176	145	47	2,368
1943	1,395	309	361	2,065	2,744	194	60	2,998
1944	1,734	380	393	2,507	3,144	219	69	3,432
1945	2,070	462	422	2,954	3,609	236	79	3,924
1946	2,443	710	472	3,625	3,984	272	91	4,347
1947	2,540	991	481	4,012	4,178	274	96	4,548
1948	2,487	1,224	484	4,195	4,172	272	100	4,544
1949	2,359	1,305	479	4,143	4,029	258	110	4,397
1950	2,399	1,373	487	4,259	4,028	259	126	4,413
1951	2,646	1,524	526	4,696	4,341	272	152	4,765
1952	2,786	1,625	545	4,956	4,442	281	176	4,899
1953	2,830	1,697	552	5,079	4,454	274	218	4,960
1954	2,942	1,724	562	5,228	4,454	274	218	4,946
1955	3,060	1,813	584	5,457	4,552	290	226	5,068
1956	3,408	1,920	616	5,944	4,753	309	238	5,300
1957	3,642	2,071	645	6,358	4,861	325	252	5,438
1958	3,841	2,146	656	6,643	4,910	330	261	5,501
1959	4,056	2,298	678	7,032	5,014	356	289	5,659
1960	4,137	2,371	690	7,198	5,039	378	317	5,734
1961	4,120	2,354	695	7,169	4,975	395	337	5,707
1962	4,494	2,463	714	7,671	5,172	427	365	5,964
1963	4,665	2,594	725	7,984	5,306	458	385	6,149
1964	4,958	2,753	761	8,472	5,465	493	408	6,366

See footnote at end of table.

Continued--

Appendix table 4--Sales of alcoholic beverages--Continued

Year	Packaged alcholic beverages				Alcoholic drinks			
	Liquor stores	Food stores	All other	Total	Eating and drinking places 1/	Hotels and motels 1/	All other	Total
	Million dollars							
1965	5,247	2,907	809	8,963	5,681	541	440	6,662
1966	5,676	3,116	864	9,656	5,981	593	487	7,061
1967	6,005	3,211	904	10,120	6,222	623	551	7,396
1968	6,576	3,444	955	10,975	6,642	667	587	7,896
1969	7,034	3,728	987	11,749	6,878	691	624	8,193
1970	7,671	4,199	1,064	12,934	7,652	760	657	9,069
1971	8,506	4,484	1,102	14,092	8,026	849	678	9,553
1972	8,810	5,137	1,113	15,060	7,911	961	704	9,576
1973	9,236	5,715	1,254	16,205	8,747	1,069	757	10,573
1974	9,948	6,432	1,355	17,735	9,371	1,167	778	11,316
1975	10,681	7,068	1,519	19,268	10,324	1,315	887	12,526
1976	11,170	7,519	1,717	20,406	11,088	1,555	947	13,590
1977	11,686	8,041	1,946	21,673	11,981	1,713	1,266	14,960
1978	12,179	8,929	2,222	23,330	13,342	2,023	1,303	16,668
1979	13,528	10,093	2,480	26,101	15,152	2,306	1,435	18,893
1980	14,977	11,590	2,816	29,383	16,722	2,450	1,497	20,669
1981	15,648	12,618	3,141	31,407	17,976	2,751	1,528	22,255
1982	15,984	13,379	3,377	32,740	18,371	2,849	1,516	22,736
1983	16,859	14,750	3,872	35,481	19,459	3,128	1,608	24,195
1984	16,074	16,541	4,196	36,811	20,721	3,386	1,664	25,771
1985	17,182	16,862	4,438	38,482	22,011	3,642	1,795	27,448
1986	17,447	17,594	4,833	39,874	23,945	3,900	1,861	29,706

1/ Includes tips.

Appendix table 5--Relative prices of food at three stages of the system

Year	Restaurant prices	Retail store prices	Manufacturers' and shippers' prices
	Percent of retail store prices		
1929	124.0	100.0	73.5
1939	124.0	100.0	72.2
1948	127.2	100.0	81.4
1954	129.6	100.0	71.3
1955	133.6	100.0	70.6
1956	135.7	100.0	70.5
1957	136.3	100.0	70.6
1958	134.6	100.0	71.6
1959	141.7	100.0	70.0
1960	144.2	100.0	70.9
1961	146.0	100.0	70.3
1962	148.9	100.0	70.1
1963	150.2	100.0	68.3
1964	151.4	100.0	67.6
1965	151.0	100.0	68.9
1966	150.5	100.0	70.8
1967	158.7	100.0	69.0
1968	161.8	100.0	69.2
1969	163.7	100.0	70.1
1970	167.3	100.0	68.9
1971	171.9	100.0	68.3
1972	171.1	100.0	69.0
1973	158.7	100.0	71.4
1974	155.8	100.0	70.9
1975	157.3	100.0	71.0
1976	162.8	100.0	69.3
1977	167.1	100.0	68.8
1978	164.9	100.0	68.0
1979	165.5	100.0	67.0
1980	168.5	100.0	65.7
1981	171.1	100.0	64.8
1982	174.2	100.0	64.0
1983	179.9	100.0	64.0
1984	180.8	100.0	64.4
1985	185.3	100.0	63.0

Appendix table 6--Expenditures for food at retail store prices, including home-produced

Year	Expenditures from sales and markups: Off premise	Expenditures from sales and markups: Meals and snacks	Expenditures from sales and markups: Total	Expenditures from prices and quantities
		Million dollars		
1929	20,027	3,500	23,527	--
1939	15,281	3,113	18,394	--
1948	38,648	10,067	48,715	--
1954	45,956	12,977	58,933	--
1955	47,030	13,057	60,087	--
1956	48,492	13,420	61,912	--
1957	51,360	13,939	65,299	--
1958	53,110	14,331	67,441	--
1959	53,310	14,472	67,782	--
1960	54,360	14,795	69,155	74,157
1961	54,882	15,225	70,107	75,582
1962	55,626	15,839	71,465	77,137
1963	55,799	16,448	72,247	78,621
1964	58,055	17,564	75,619	81,937
1965	60,840	18,828	79,668	84,415
1966	63,153	20,629	83,782	89,658
1967	63,470	22,156	85,626	91,802
1968	66,803	22,723	89,526	97,729
1969	71,385	24,190	95,575	104,290
1970	77,860	25,881	103,741	111,927
1971	81,788	26,834	108,622	117,297
1972	87,166	29,248	116,414	124,386
1973	98,679	34,921	133,600	142,246
1974	113,731	40,127	153,858	166,477
1975	121,035	45,323	166,358	181,065
1976	128,286	49,522	177,808	191,794
1977	137,205	53,289	190,494	201,521
1978	150,973	60,759	211,732	226,834
1979	168,419	68,910	237,329	254,874
1980	186,591	75,149	261,740	278,411
1981	199,439	81,050	280,489	302,160
1982	206,949	85,240	292,189	309,448
1983	215,930	90,543	306,473	324,247
1984	225,297	96,724	322,021	339,286

-- = Not available.

Appendix table 7--Food prices by eight measures

Year	BLS indexes 1/			GNP deflator 2/			Link-and-chain index for food at home	Implicit deflator from food expenditures for all food
	All food	Food at home	Food away from home	All food	Food at home	Food away from home		
	1977=100							
1960	45.8	47.1	40.6	46.7	48.4	41.1	45.9	43.8
1961	46.4	47.5	41.5	47.2	48.8	41.9	45.9	43.7
1962	46.8	47.8	42.6	47.7	49.2	43.1	46.3	43.8
1963	47.5	48.5	43.6	48.4	49.8	44.1	46.8	44.5
1964	48.1	49.0	44.4	49.3	50.7	44.8	47.5	45.2
1965	49.1	50.2	45.4	50.5	51.9	45.9	48.7	46.4
1966	51.6	52.7	47.5	53.1	54.7	48.0	50.7	48.2
1967	52.0	52.6	49.9	53.5	54.4	50.5	50.7	47.7
1968	53.9	54.3	52.5	55.5	56.4	53.1	52.7	50.2
1969	56.7	56.9	55.7	58.5	59.1	56.3	55.5	52.8
1970	59.8	59.8	59.9	61.8	62.3	60.5	58.3	55.4
1971	61.6	61.2	63.0	63.4	63.4	63.6	60.0	58.9
1972	64.3	63.9	65.5	66.8	67.0	66.3	62.9	61.7
1973	73.6	74.3	70.6	76.4	76.7	71.9	72.7	71.4
1974	84.1	85.4	79.6	86.9	89.1	80.7	84.8	84.0
1975	91.3	92.4	87.0	93.0	95.0	87.8	93.8	93.9
1976	94.1	94.4	92.9	95.6	96.2	93.6	94.8	94.9
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	110.0	110.5	109.0	110.1	110.8	108.4	110.4	110.3
1979	122.0	122.5	121.3	121.6	121.9	120.4	121.7	121.5
1980	132.5	132.2	133.3	131.3	130.8	132.4	131.5	131.1
1981	142.9	141.9	145.3	142.7	142.0	144.2	139.9	136.2
1982	148.6	146.8	153.0	148.6	147.3	152.0	143.1	142.5
1983	151.8	148.4	159.7	150.9	147.9	158.7	144.1	143.3
1984	157.6	153.8	166.5	159.5	155.8	165.3	149.6	149.0

1/ BLS = Bureau of Labor Statistics, U.S. Department of Labor.
2/ GNP = gross national product.

Appendix table 8--Per capita quantity indexes

Year	Quantity indexes			Expenditures deflated by--			
	Pounds of food	Price-weighted quantity (1967-69 weights)	Link-and-chain quantity	BLS 1/ all-food price index	Link-and-chain price index	BLS 1/ food at home price index	GNP 2/ deflator
				1977=100			
1960	92.9	90.7	91.5	88.6	96.6	94.1	88.3
1961	92.3	90.7	92.4	87.5	96.4	93.0	87.4
1962	91.1	90.9	92.4	87.8	95.8	92.8	87.5
1963	93.6	91.5	92.5	86.4	94.5	91.2	86.1
1964	94.0	92.6	93.9	88.4	96.0	93.1	87.7
1965	93.7	91.9	93.5	90.4	97.4	94.6	89.4
1966	95.1	93.0	94.8	89.9	97.5	93.8	88.8
1967	95.3	94.4	96.5	90.3	98.7	95.1	89.3
1968	97.0	96.1	97.9	92.2	98.2	95.4	91.0
1969	97.1	96.3	98.4	93.0	98.6	96.2	91.7
1970	97.3	97.1	99.2	95.0	100.7	98.1	93.5
1971	97.8	98.1	99.7	96.2	100.9	99.0	94.9
1972	97.8	97.9	99.8	98.0	102.1	100.4	95.8
1973	97.8	97.1	97.8	96.1	100.3	98.1	93.9
1974	96.6	97.5	97.3	95.4	98.1	97.4	92.4
1975	97.4	97.3	95.7	95.1	95.0	96.4	93.4
1976	99.7	101.1	100.5	99.1	99.4	99.9	97.5
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.2	99.9	100.9	100.0	99.6	99.5	99.9
1979	101.8	100.9	102.2	100.3	100.2	99.5	100.7
1980	101.7	100.4	101.8	100.9	101.1	100.5	100.9
1981	101.3	100.4	102.1	99.8	100.7	99.3	100.0
1982	100.7	100.1	100.8	99.7	101.5	99.0	99.7
1983	103.2	103.0	104.1	102.7	104.7	101.7	103.4
1984	--	--	--	103.8	105.5	102.6	103.2
1985	--	--	--	105.0	--	--	105.2

-- = Not available.

Note: Annual data not calculated for the other index.

1/ BLS = Bureau of Labor Statistics, U.S. Department of Labor.

2/ GNP = gross national product.

Appendix table 9--Expenditures for purchased food by farm-product group, excluding food produced at home

Year	Meat products	Poultry products	Seafood	Dairy products	Fruits and vegetables	Grain products	Sweeteners	Fats and oils	Nuts	Coffee, tea, and cocoa	Other products	All purchased food
						Million dollars						
1960	16,049	5,337	1,432	10,615	14,392	6,616	7,163	3,068	1,943	2,141	375	69,131
1961	16,644	5,485	1,549	10,742	14,368	6,857	7,396	3,262	1,792	2,110	383	70,588
1962	17,539	5,626	1,635	10,938	14,544	7,077	7,739	3,395	1,850	2,124	396	72,863
1963	17,951	5,644	1,653	10,960	15,328	7,156	8,347	3,472	1,190	2,157	405	74,263
1964	18,742	5,900	1,621	11,301	16,317	7,406	8,969	3,660	1,449	2,482	425	78,272
1965	20,049	6,313	1,799	11,740	17,187	7,790	9,446	4,048	1,598	2,558	455	82,983
1966	22,717	7,280	1,994	12,702	18,279	8,321	10,020	4,620	1,484	2,570	495	87,912
1967	22,903	6,881	1,969	12,636	17,700	8,425	10,385	4,546	1,615	2,525	493	90,078
1968	24,624	7,152	2,060	13,404	19,433	8,568	11,263	4,775	1,768	2,809	585	96,441
1969	27,529	8,113	2,192	13,963	20,184	8,847	12,330	5,062	1,788	2,919	673	103,600
1970	30,187	8,747	2,557	15,024	21,605	9,317	13,581	5,695	2,071	3,617	798	113,199
1971	31,226	8,947	2,784	15,980	22,584	10,003	14,907	6,246	2,229	4,042	910	119,858
1972	35,810	9,229	3,288	16,554	23,772	10,080	15,580	6,762	2,324	4,660	1,040	129,099
1973	40,426	12,336	3,765	18,152	26,814	11,401	16,721	7,422	2,382	5,197	1,252	145,868
1974	42,589	12,696	3,969	21,057	29,161	14,403	22,014	9,947	2,987	6,438	1,526	166,787
1975	43,297	13,546	4,260	22,377	32,083	16,414	26,801	11,121	4,005	7,207	1,773	182,884
1976	47,931	14,868	5,124	25,128	34,119	17,010	27,283	11,349	3,913	9,860	2,010	198,595
1977	49,305	17,169	5,042	26,669	37,579	17,118	31,089	13,320	4,122	12,267	2,109	215,789
1978	57,651	18,535	5,729	28,770	42,180	18,515	32,800	14,335	4,774	12,963	3,969	240,221
1979	67,565	20,977	6,079	31,402	47,935	21,638	34,849	15,552	5,098	13,051	6,339	270,485
1980	72,034	22,472	6,590	36,592	52,909	24,971	39,238	16,872	4,724	13,357	9,005	298,564
1981	74,035	23,473	7,087	39,700	59,383	27,912	41,280	17,929	6,146	12,626	11,857	321,428
1982	77,675	23,967	7,013	42,897	63,001	30,367	41,194	17,981	6,670	12,374	14,657	337,796
1983	81,141	25,365	7,777	45,533	69,179	32,052	43,868	19,189	6,935	13,163	15,627	359,829
1984	82,758	28,997	8,519	47,826	71,296	34,333	49,267	20,497	7,655	14,367	16,594	382,109

Appendix table 10--Food expenditures by origin

Year	Nonfarm home production, fish and game 1/	Farm		Other (imports, fish, and synthetics)	Total	Nonfarm home production	Farm		Other
		Home use 1/	Sales				Home use	Sales	
	Million dollars					Percent			
1869	365	829	2,099	338	3,631	10.1	22.8	57.8	9.3
1879	349	714	2,615	408	4,086	8.5	17.5	64.0	10.0
1889	381	1,024	2,639	411	4,455	8.6	23.0	59.2	9.2
1899	334	1,016	3,630	535	5,515	6.1	18.4	65.8	9.7
1909	597	1,620	6,230	1,051	9,498	6.3	17.1	65.6	11.0
1914	712	1,707	7,107	1,396	10,922	6.5	15.6	65.1	12.8
1919	1,431	3,275	14,244	3,225	22,175	6.5	14.8	64.2	14.5
1921	1,239	2,944	10,985	2,448	17,616	7.0	16.7	62.4	13.9
1923	1,312	3,061	12,594	2,761	19,728	6.7	15.5	63.8	14.0
1925	1,479	3,091	14,493	3,158	22,221	6.7	13.9	65.2	14.2
1927	1,427	3,180	14,642	3,178	22,427	6.4	14.2	65.3	14.1
1929	1,520	3,038	15,991	3,449	23,998	6.3	12.7	66.6	14.4
1939	1,140	2,130	13,082	2,445	18,797	6.1	11.3	69.6	13.0
1950	2,369	3,422	38,692	7,014	51,497	4.6	6.7	75.1	13.6
1960	2,396	2,201	58,754	10,377	73,728	3.3	3.0	79.7	14.0
1970	2,526	1,285	99,282	13,917	117,010	2.2	1.1	84.8	11.9
1980	6,208	1,987	236,243	62,131	306,659	2.0	.6	77.1	20.3
1982	7,016	2,022	267,924	70,406	347,368	2.0	.6	77.1	20.3

1/ At local retail store prices.

Appendix table 11--Expenditures for manufactured and fresh foods

Year	Food produced at home			Sales					
					Manufactured				
	Total	Farm-manufactured products	Fresh products 1/	Total	Factories	Farm and retail	Total	Fresh products 2/	Total
					Million dollars				
1869	1,194	538	656	2,437	880	1,247	2,127	310	3,631
1879	1,063	347	716	3,023	1,247	1,288	2,535	488	4,086
1889	1,405	592	813	3,050	1,784	683	2,467	583	4,455
1899	1,305	486	864	4,165	2,575	762	3,337	828	5,515
1909	2,217	835	1,382	7,281	4,703	1,095	5,798	1,483	9,498
1919	4,706	1,409	3,297	17,469	12,680	1,921	14,602	2,868	22,175
1929	4,558	897	3,661	19,440	14,025	2,084	16,109	3,331	23,998
1940	3,438	619	2,819	12,446	9,523	858	10,381	2,065	15,884
1950	5,791	835	4,956	45,706	37,458	1,164	38,622	7,084	51,497
1960	4,597	417	4,180	69,131	59,097	839	59,936	9,195	73,728
1970	3,811	369	3,442	113,201	97,500	1,776	99,276	13,923	117,010
1980	8,195	897	7,298	298,374	264,554	3,664	268,218	30,156	306,569
					Percent				
1869	32.9	14.8	18.1	67.1	24.2	34.4	58.6	8.5	100.0
1879	26.0	8.5	17.5	74.0	30.5	31.5	62.0	12.0	100.0
1889	31.5	13.3	18.2	68.5	40.1	15.3	55.4	13.1	100.0
1899	24.5	8.8	15.7	75.5	46.7	13.8	60.5	15.0	100.0
1909	23.4	8.8	14.6	76.6	49.5	11.5	61.0	15.6	100.0
1919	21.2	6.3	14.9	78.8	57.2	8.7	65.9	12.9	100.0
1929	19.0	3.7	15.3	81.0	58.4	8.7	67.1	13.9	100.0
1940	21.6	3.9	17.7	78.4	60.0	5.4	65.4	13.0	100.0
1950	11.2	3.9	8.3	88.8	72.7	2.3	75.0	13.8	100.0
1960	6.2	1.6	4.6	93.8	80.2	1.1	81.3	12.5	100.0
1970	3.3	.6	2.7	96.7	83.3	1.5	84.8	11.9	100.0
1980	2.7	.3	2.4	97.3	86.3	1.2	87.5	9.8	100.0

1/ Fish and game, milk, eggs, fruits and vegetables, and honey.
2/ Shell eggs, fresh fruits and vegetables, honey, and fresh seafood (not handled by manufacturers).

Appendix table 12--Expenditures for food by source of funds

Year	Food for offpremise use				Meals and snacks				All food
	Governments	Families and individuals	Food produced at home	Total	Governments	Businesses 1/	Families and individuals	Total	Families and individuals
	Million dollars								
1929:	0	15,319	4,558	19,877	189	1,328	2,604	4,121	17,923
1933:	0	9,192	2,963	12,155	127	841	1,481	2,459	10,673
1935:	0	10,850	3,613	14,463	157	876	1,801	2,834	12,651
1936:	25	11,417	3,550	14,992	172	984	2,005	3,161	13,422
1937:	28	11,981	3,586	15,595	180	1,195	2,241	3,616	14,222
1938:	50	11,427	3,222	14,699	180	1,060	2,149	3,389	13,576
1939:	70	11,844	3,270	15,184	237	1,131	2,245	3,613	14,089
1940:	122	12,324	3,438	15,884	241	1,226	2,439	3,906	14,763
1941:	148	13,840	3,802	17,790	471	1,436	2,892	4,799	16,732
1942:	100	16,588	4,314	21,002	933	1,775	3,586	6,294	20,174
1943:	32	18,372	4,986	23,390	1,698	2,195	4,452	8,345	22,824
1944:	1	19,900	5,009	24,910	2,396	2,458	5,059	9,893	24,959
1945:	0	21,127	5,309	26,436	2,764	2,771	5,700	11,235	26,827
1946:	0	26,114	6,099	32,213	1,308	3,196	6,528	11,032	32,642
1947:	0	30,295	6,544	36,839	1,002	3,637	7,443	12,082	37,738
1948:	0	31,907	6,706	38,613	1,094	3,632	7,510	12,236	39,417
1949:	3	31,715	5,893	37,611	1,108	3,527	7,367	12,002	39,082
1950:	6	33,231	5,793	39,028	1,184	3,729	7,556	12,469	40,787
1951:	4	37,207	6,360	43,571	1,831	4,018	8,397	14,246	45,604
1952:	0	39,059	6,293	45,352	1,973	4,173	8,781	14,927	47,840
1953:	6	39,802	5,967	45,775	1,883	4,334	9,014	15,231	48,816
1954:	37	40,049	5,642	45,728	1,791	4,347	9,279	15,417	49,328
1955:	76	41,314	5,394	46,784	1,630	4,553	9,826	16,009	51,140
1956:	84	42,925	5,240	48,249	1,588	4,796	10,407	16,791	53,332
1957:	77	45,827	5,216	51,120	1,623	4,985	10,937	17,545	56,764
1958:	91	47,585	5,215	52,891	1,661	5,093	11,135	17,889	58,720
1959:	83	48,076	4,905	53,064	1,636	5,359	11,839	18,834	59,915

See footnote at end of table.

Continued--

Appendix table 12--Expenditures for food by source of funds--Continued

Year	Food for offpremise use				Meals and snacks				All food
	Governments	Families and individuals	Food produced at home	Total	Governments	Businesses 1/	Families and individuals	Total	Families and individuals
	Million dollars								
1960	100	49,424	4,597	54,121	1,692	5,549	12,466	19,607	61,890
1961	190	50,006	4,408	54,611	1,775	5,670	12,940	20,385	62,946
1962	223	51,038	4,137	55,405	1,841	5,910	13,844	21,595	64,882
1963	237	51,399	3,769	55,475	1,854	6,048	14,645	22,557	66,044
1964	249	53,701	3,767	57,717	1,934	6,384	16,004	24,322	69,705
1965	229	56,557	3,756	60,542	1,981	6,744	17,472	26,197	74,029
1966	204	59,007	3,694	62,905	2,280	7,233	19,198	28,701	78,205
1967	254	59,405	3,544	63,203	2,651	7,391	20,377	30,419	79,791
1968	363	62,453	3,707	66,523	2,772	7,958	22,730	33,460	85,183
1969	500	66,749	3,849	71,098	2,945	8,381	24,789	36,115	91,538
1970	1,378	72,338	3,811	77,527	2,980	8,992	27,611	39,583	99,949
1971	1,960	75,667	3,819	81,446	3,326	9,286	29,639	42,251	105,306
1972	2,205	80,575	4,072	86,852	3,605	9,865	32,849	46,319	113,424
1973	2,361	90,988	5,065	98,414	4,111	11,200	37,205	52,516	128,233
1974	3,618	103,807	6,025	113,450	4,926	12,530	41,906	59,362	145,713
1975	4,719	110,094	5,956	120,769	5,532	14,224	48,315	68,071	158,409
1976	4,847	117,009	6,128	127,984	6,058	15,875	54,806	76,739	171,815
1977	4,672	125,885	6,002	136,559	6,588	17,137	61,279	85,004	187,164
1978	5,004	138,981	6,435	150,420	7,250	19,138	69,845	96,233	208,826
1979	6,976	153,871	6,945	167,782	8,197	21,601	79,597	109,395	233,468
1980	8,980	168,754	8,195	185,929	9,072	23,739	87,829	120,640	256,583
1981	10,804	178,916	9,190	198,910	9,263	25,934	96,667	131,864	275,583
1982	11,089	186,080	9,038	206,207	9,538	27,556	104,067	141,161	290,147
1983	13,478	193,641	8,682	215,774	9,916	29,841	114,591	154,348	308,232
1984	13,207	205,197	8,117	226,585	10,257	32,238	124,403	166,898	329,600
1985	13,300	213,084	6,860	233,244	10,303	33,996	133,088	177,295	346,172

1/ Includes minor amount from philanthropy.

Appendix table 13--Food expenditures, by source of funds

Year	Families and individuals	Food produced at home	Governments	Businesses
		Percent		
1960	83.9	6.2	2.4	7.5
1961	83.9	5.9	2.6	7.6
1962	84.2	5.4	2.7	7.7
1963	84.7	4.8	2.7	7.8
1964	84.9	4.6	2.7	7.8
1965	85.3	4.3	2.6	7.8
1966	85.4	4.0	2.7	7.9
1967	85.2	3.8	3.1	7.9
1968	85.2	3.7	3.1	8.0
1969	85.4	3.6	3.2	7.8
1970	85.3	3.3	3.7	7.7
1971	85.1	3.1	4.3	7.5
1972	85.1	3.1	4.4	7.4
1973	84.9	3.4	4.3	7.4
1974	84.3	3.5	5.0	7.2
1975	83.9	3.2	5.4	7.5
1976	84.0	3.0	5.3	7.7
1977	84.5	2.7	5.1	7.7
1978	84.7	2.6	5.0	7.7
1979	84.3	2.5	5.5	7.7
1980	83.7	2.7	5.9	7.7
1981	83.3	2.8	6.1	7.8
1982	83.6	2.6	5.9	7.9
1983	83.3	2.3	6.3	8.1
1984	83.8	2.1	5.9	8.2
1985	84.3	1.7	5.7	8.3

Appendix table 14--Food expenditures as a percentage of income, various measures

Year	Total food expenditures 1/	Expenditures by families and individuals including food produced at home valued at--		
		Farm prices, excluding food stamps	Retail prices	
			Food stamps excluded	Food stamps included
	Percent			
1869	2/ 60.6	--	--	--
1879	56.5	--	--	--
1889	34.0	--	--	--
1899	31.9	--	--	--
1909	29.6	--	--	--
1919	30.0	--	--	--
1929	28.3	24.2	26.6	26.6
1939	26.1	21.9	24.2	24.2
1940	25.6	21.5	23.6	23.7
1941	23.9	19.6	21.9	21.9
1942	22.9	19.1	20.8	20.8
1943	23.4	19.2	20.7	20.8
1944	23.4	19.1	20.5	20.5
1945	24.7	20.1	21.5	21.5
1946	26.6	22.6	24.0	24.0
1947	28.0	24.4	25.8	25.8
1948	26.4	22.7	24.1	24.1
1949	25.9	22.3	23.6	23.6
1950	24.3	21.0	22.1	22.1
1951	24.9	21.4	22.6	22.6
1952	24.7	21.2	22.4	22.4
1953	23.5	20.2	21.3	21.3
1954	23.1	19.9	20.9	20.9
1955	22.2	19.2	20.1	20.1
1956	21.6	18.7	19.5	19.5
1957	21.6	18.8	19.6	19.6
1958	21.5	18.7	19.5	19.5
1959	20.6	18.0	18.7	18.7
1960	20.3	17.8	18.4	18.4
1961	19.8	17.3	17.9	17.9
1962	19.2	26.8	17.3	17.3
1963	18.6	16.2	16.7	16.7
1964	18.0	15.8	16.2	16.2

See footnotes at end of table.

Continued--

Appendix table 14--Food expenditures as a percentage of income, various measures--Continued

Year	Total food expenditures 1/	Expenditures by families and individuals including food produced at home valued at--		
		Farm prices, excluding food stamps	Retail prices	
			Food stamps excluded	Food stamps included
	Percent			
1965	17.7	15.5	15.9	15.9
1966	17.3	15.2	15.5	15.6
1967	16.5	14.3	14.6	14.6
1968	16.3	14.2	14.6	14.6
1969	16.2	14.2	14.5	14.5
1970	16.2	14.2	14.5	14.6
1971	15.8	13.8	14.1	14.2
1972	15.8	13.7	14.0	14.2
1973	15.8	13.7	14.0	14.2
1974	16.5	14.3	14.6	14.9
1975	16.4	14.1	14.4	14.8
1976	16.2	13.9	14.2	14.6
1977	16.0	13.8	14.1	14.3
1978	15.8	13.6	13.9	14.2
1979	15.9	13.7	14.0	14.3
1980	15.9	13.6	13.9	14.2
1981	15.4	13.1	13.4	13.8
1982	15.2	13.4	13.7	14.0
1983	15.1	12.8	13.1	13.5
1984	14.5	12.4	12.6	12.9
1985	14.5	12.3	12.6	12.9

-- = Not available.

1/ With home-produced foods at retail prices.

2/ 50.9 percent with home-produced foods at farm prices.

Appendix table 15--Farm value or equivalent, marketing bill, and expenditures for all food sold for domestic consumption

Year	Farm value or equivalent	Marketing bill	Expenditures	Share of expenditures: Farm value or equivalent	Share of expenditures: Marketing bill
	Million dollars			Percent	
1960	24,612	44,519	69,131	35.6	64.4
1961	24,744	45,844	70,588	35.1	64.9
1962	25,637	47,226	72,863	35.2	64.8
1963	25,637	48,626	74,263	34.5	65.5
1964	25,446	52,826	78,272	32.5	67.5
1965	28,404	54,579	82,983	34.2	65.8
1966	31,412	57,079	88,491	35.5	64.5
1967	31,327	58,751	90,078	34.8	65.2
1968	33,333	63,108	96,441	34.6	65.4
1969	36,070	67,332	103,402	34.9	65.1
1970	37,233	75,966	113,119	32.9	67.1
1971	38,444	81,414	119,858	32.1	67.9
1972	42,820	86,279	129,099	33.2	66.8
1973	54,904	90,964	145,868	37.6	62.4
1974	61,846	104,941	166,787	37.1	62.9
1975	62,289	120,595	182,884	34.1	65.9
1976	64,498	134,097	198,595	32.5	67.5
1977	67,881	147,908	215,789	31.5	68.5
1978	77,481	162,740	240,221	32.3	67.7
1979	87,199	183,286	270,485	32.2	67.8
1980	93,426	205,138	298,564	31.3	68.7
1981	92,185	229,243	321,428	28.7	71.3
1982	94,113	243,683	337,796	27.9	72.1
1983	100,552	259,277	359,829	27.9	72.1
1984	103,522	279,127	382,649	27.1	72.9

Note: Excludes food produced at home.

Appendix table 16--Food marketing services for sales for domestic use

Year	Quantity of food marketing services per person 1/		Price of food marketing services		Implicit deflator for personal consumption expenditures other than food 5/	Labor productivity		Labor in food marketing	
	Total	Excluding food service 2/	Nominal 3/	Real 4/		Total	Excluding food service 2/	Total 6/	Excluding food service 7/
	1980 = 100				1972 = 100	1980 = 100		Million labor hours	
1960:	87.6	98.4	31.2	75.0	72.5	92.4	81.6	11,766	7,754
1961:	88.4	99.7	31.3	75.2	73.2	96.6	85.9	11,552	7,588
1962:	89.1	99.3	31.5	74.4	74.3	98.0	87.5	11,652	7,542
1963:	88.3	98.4	32.3	75.1	75.5	99.3	89.4	11,558	7,415
1964:	89.9	98.8	34.0	78.0	76.4	100.4	90.4	11,812	7,466
1965:	90.9	98.2	34.3	77.5	77.6	99.5	89.9	12,197	7,552
1966:	92.5	99.1	34.5	76.3	79.4	100.5	91.1	12,416	7,607
1967:	93.6	101.2	35.1	75.5	81.7	101.4	93.9	12,567	7,610
1968:	95.3	106.1	36.7	75.8	85.0	103.8	99.1	12,627	7,629
1969:	95.9	102.4	38.7	76.5	88.7	104.3	96.2	12,770	7,659
1970:	96.0	103.0	42.9	81.3	92.5	106.5	98.5	12,693	7,625
1971:	96.5	104.0	45.1	81.8	96.8	108.0	101.9	12,748	7,542
1972:	97.5	103.2	46.7	82.1	100.0	108.9	101.5	12,919	7,602
1973:	97.2	100.5	48.9	82.6	104.0	108.2	101.3	13,093	7,495
1974:	95.8	99.5	56.7	87.6	113.5	104.9	100.5	13,450	7,543
1975:	96.1	97.6	64.3	92.2	122.3	104.3	99.2	13,704	7,580
1976:	99.6	100.8	68.2	92.6	129.3	104.0	100.0	14,378	7,831
1977:	99.4	99.8	74.0	94.6	137.3	101.8	99.4	14,806	7,880
1978:	100.3	99.8	80.3	96.5	146.0	100.6	99.3	15,277	7,978
1979:	101.7	101.4	88.6	98.0	158.7	100.5	99.0	15,673	8,222
1980:	100.0	100.0	100.0	100.0	175.6	100.0	100.0	15,675	8,119
1981:	100.9	101.5	110.8	102.2	190.4	100.6	102.1	15,869	8,149
1982:	100.7	99.7	118.9	103.3	202.0	100.9	102.7	15,938	8,027

1/ Marketing bill at 1980 prices, divided by resident population.
2/ Excludes marketing services in food service.
3/ Implicit price deflator for food marketing services.
4/ Nominal divided by implicit deflator for personal consumption expenditures less food and alcoholic beverages.
5/ Calculated from National Income and Product Accounts.
6/ Hired and unpaid labor in food manufacturing, transportation, warehousing, wholesaling, retailing, and food service. Includes only food for sale for domestic use (excludes labor on exports and nonfoods). Labor requirements in other (nonfood) stores calculated at the same rate as in grocery stores. Labor requirements in food service other than eating and drinking places calculated at the same rate per dollar of sales as in eating and drinking places.
7/ Excludes labor in food service.

Appendix table 17--Food service as share of total food expenditures

Year	Share of total dollars	Share of total food (quantity)	Share of personal dollars
		Percent	
1929	17.2	14.9	14.5
1939	19.2	16.9	15.9
1948	24.1	20.7	19.1
1954	25.2	22.0	18.8
1955	25.5	21.7	19.2
1956	25.8	21.7	19.5
1957	25.6	21.3	19.3
1958	25.3	21.2	19.0
1959	26.2	21.4	19.8
1960	26.6	21.4	20.1
1961	27.2	21.7	20.6
1962	28.0	22.2	21.3
1963	28.9	22.8	22.2
1964	29.6	23.2	23.0
1965	28.6	23.6	23.6
1966	31.3	24.6	24.5
1967	32.5	25.9	25.5
1968	33.5	25.4	26.7
1969	33.7	25.3	27.1
1970	33.7	23.1	27.6
1971	34.1	24.7	28.1
1972	34.8	25.1	29.0
1973	34.8	26.1	29.0
1974	34.4	26.1	28.8
1975	36.0	27.2	30.5
1976	37.5	27.9	31.9
1977	38.4	28.0	32.7
1978	39.0	28.7	33.4
1979	39.5	29.0	34.1
1980	39.4	28.7	34.2
1981	39.9	28.9	35.1
1982	40.6	29.2	35.9
1983	41.7	29.5	37.2
1984	42.4	29.6	37.7
1985	43.2	28.5	38.4

-- = Not available.

Appendix table 18--Adjusted personal food consumption expenditures, national income and product accounts 1/

Year	Food purchased for offpremise consumption	Purchased meals and nonalcoholic beverages	Food furnished			Food produced and consumed on farms	Total food 1/
			Civilian	Military	Total		
			Million dollars				
1947	31,859	8,146	610	413	1,023	2,560	43,588
1948	34,257	8,272	610	411	1,021	2,539	46,089
1949	33,394	8,136	567	433	1,000	2,059	44,589
1950	34,467	8,319	664	412	1,076	1,905	45,767
1951	38,721	9,350	636	996	1,632	2,168	51,871
1952	40,729	9,820	649	1,120	1,769	2,098	54,416
1953	41,592	10,012	653	997	1,650	1,887	55,141
1954	42,989	10,022	646	832	1,478	1,678	56,167
1955	44,450	10,386	651	641	1,292	1,563	57,691
1956	46,457	10,896	675	523	1,198	1,481	60,032
1957	49,476	11,378	705	513	1,218	1,391	63,463
1958	52,032	11,491	735	509	1,244	1,410	66,177
1959	53,983	13,182	751	455	1,206	1,215	69,586
1960	54,992	13,982	782	427	1,209	1,134	71,317
1961	56,135	14,735	816	465	1,281	1,049	73,200
1962	56,717	15,755	853	486	1,339	944	74,755
1963	57,652	16,639	886	464	1,350	879	76,520
1964	61,083	17,720	918	456	1,374	801	80,978
1965	65,778	18,723	991	494	1,485	780	86,766
1966	71,376	19,780	1,105	664	1,769	794	93,719
1967	72,945	20,483	1,146	798	1,944	710	96,082
1968	78,209	22,882	1,225	748	1,973	694	103,758
1969	83,618	24,914	1,343	710	2,053	707	111,332
1970	90,449	27,500	1,464	601	2,065	725	120,789
1971	92,565	29,044	1,544	444	1,988	708	124,665
1972	98,517	31,962	1,634	376	2,010	805	133,294
1973	109,395	35,838	1,769	403	2,172	1,064	148,469
1974	123,756	39,937	2,266	456	2,722	1,236	167,651
1975	135,500	45,318	2,664	504	3,168	1,212	185,198
1976	144,905	50,384	3,074	535	3,609	1,263	200,161
1977	155,706	56,203	3,196	553	3,749	1,092	216,750
1978	168,975	65,068	3,681	583	4,264	1,112	239,419
1979	188,550	75,419	4,278	626	4,904	1,183	270,056
1980	206,377	83,674	4,913	645	5,558	1,058	296,667
1981	224,394	89,142	5,528	652	6,180	1,044	320,760
1982	238,844	95,068	5,941	614	6,555	965	341,432
1983	248,706	104,671	6,306	606	6,912	1,013	361,346
1984	265,159	114,443	6,842	590	7,432	1,024	388,342
1985	276,312	121,518	7,380	591	7,971	893	406,694

1/ Pet food, feed, and ice subtracted.

METHODOLOGY

The method used to estimate most food expenditures starts with current estimates of sales or receipts. In 1980, this type of estimate accounted for 94 percent of food for offpremise use, 78 percent of meals and snacks, and 95 percent or more of all alcoholic beverages (app. tables 19 and 20).

Small amounts of data are based directly on reports of food expenditures--sales in railroad dining cars (NRPC, Amtrak) and airline payments for food service (CAB, 1979) (app. table 19, line 2).

Rough estimates of various types are used where no other method appears to be available. These estimates, accounting for less than 1 percent of each category, include lunchrooms in office buildings not operated by contractors, concessionaires, or independent operators (app. table 19, line 3).

For some categories, most notably hospitals and institutions, no data on food purchases were available either on a current or on a periodic basis (app. table 19, line 4). In these cases, base year data were supplied by one-time surveys, mostly for 1969 and 1979 from Van Dress (1971 and 1982). The estimates for other years were derived by using other series. For example, hospital and institutional use was estimated for other years using the base-year expenditures and an index incorporating number of residents and the wholesale price index for food. Direct sales by farmers to consumers are based on a 1977 survey (USDA, ESCS, 1979).

Food furnished to civilian employees is taken directly from personal consumption expenditures of NIA (app. table 19, line 5) reported by the U.S. Department of Commerce (USDC, BEA).

Appendix table 19--Methods of estimating food expenditures, 1980

Method 1/	Food for offpremise use	Meals and snacks	Packaged alcoholic beverages	Alcoholic drinks
		Percent		
Current sales or receipts	93.9	73.1	99.0	94.7
Reported	--	1.4	0	0
Rough estimates	.3	.5	.6	.9
Base year/mover	5.8	12.0	.4	4.4
Personal consumption expenditures component	0	2/ 3.7	0	0
Elementary and secondary schools	0	9.3	0	0

-- = Less than 0.05 percent.
1/ See text for description of each method.
2/ Meals served free to employees.

The estimates for elementary and secondary schools are based on data from Census reports, the National School Lunch Program, the School Breakfast Program, and the Special Milk Program (app. table 19, line 6). Sales (children's payments) are reported by the Census of Governments and annual Bureau of the Census reports of school finances since 1977. Before 1977, estimates were based on the data from USDA child nutrition programs (USDA, FNS) adjusted to totals for all school food service, including schools not participating in the Federal programs and a la carte service in participating schools. Estimates of total school food service were obtained from periodic national surveys (Anderson, 1958a, 1958b; Anderson and Hoofnagle, 1960; Freund, 1971; Kriesberg, 1964a, 1964b, 1965; Robinson, 1978; VanDress and Putnam, 1983.

Appendix table 20--Types of businesses selling food for which current data on retail sales or service receipts are available

Type of business	Offpremise food	Meals and snacks
Grocery stores	X	X
Retail bakeries	X	X
Other food stores	X	X
Military commissary stores 1/	X	X
Military exchanges 1/	X	X
Military clubs 1/		X
Department stores	X	X
Other general merchandise stores	X	X
Variety stores	X	X
Gasoline stations	X	X
Drug stores	X	X
Liquor stores	X	
Restaurants, lunchrooms, and cafeterias	X	X
Refreshment (fast food) places	X	X
Caterers		X
Drinking places (bars)	X	X
Mail order houses	X	
Direct selling organizations	X	X
Hotels, motels, and tourist courts		X
Vending machine operators		X
Motion picture theaters		X
Bowling alleys and pool parlors		X
Trailer parks and transient campgrounds	X	
Sporting and recreational camps		X

1/ From military data. All others are based on data from the Bureau of the Census.

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